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Assessment of Traffic Congestion in Sta. Cruz, Zamboanga City: Implication for Public Policy and Urban Planning

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A B S T R A C T

Traffic congestion has become an increasingly persistent challenge in rapidly urbanizing areas of the Philippines, affecting daily mobility, productivity, and overall quality of life. While much of the existing literature focuses on metropolitan centers, limited attention has been given to traffic conditions at the barangay level, particularly in secondary cities such as Zamboanga City. This study examines the extent and causes of traffic congestion in Sta. Cruz, Zamboanga City, and evaluates its implications for public policy and urban planning. Using a mixed-methods approach, the study combined survey data from 30 road users with key informant interviews involving Barangay officials, LTFRB, ZCTMO. Purposive sampling was employed to ensure that participants possessed direct experience with traffic conditions and governance in the study area. Quantitative data were analyzed using descriptive statistics, while qualitative responses were examined through thematic analysis. Findings reveal that traffic congestion in Sta. Cruz is moderate but frequent, with congestion occurring most often during afternoon peak hours along main roads and market areas. Narrow road networks, inadequate road design, illegal parking, weak traffic discipline, and limited enforcement capacity emerged as the primary contributors to congestion. Although traffic policies are in place, their effectiveness is constrained by uneven implementation, inconsistent inter-agency coordination, and low public compliance. The results further indicate that congestion negatively affects residents' mobility, productivity, and confidence in local governance. Based on these findings, the study recommends integrated public policy and urban planning interventions, including targeted road widening and bottleneck redesign, stricter and more consistent traffic enforcement, strengthened inter-agency coordination, barangay-level traffic management planning, and community-based traffic discipline programs. These localized and evidence-based strategies aim to promote sustainable mobility and improve traffic governance in Sta. Cruz, with potential applicability to similar urban barangays in secondary Philippine cities.

1. INTRODUCTION

Traffic congestion remains a pervasive urban problem across rapidly urbanizing cities in developing countries, significantly impacting economic efficiency, public health, and mobility (Transportation in the Philippines, 2024. In the Philippine context, rapidly increasing private vehicle ownership and inadequate mass transit options have exacerbated traffic issues, leading to serious productivity losses and environmental degradation, notably in Metro Manila (Transportation in the Philippines, 2024). Zamboanga City is not spared from this national trend. A recent commuter-focused study in Zamboanga revealed that traffic congestion significantly affects public transport users—resulting in prolonged travel times, heightened stress, and hampered productivity. Key contributors include inadequate road infrastructure, unregulated street parking, and fragmented traffic management strategies (Moreno, 2023). Other localized Philippine studies reinforce similar themes: in Albay, key drivers of congestion include high traffic volume, population growth, inadequate infrastructure, poor public transport, and substandard road quality (Balla & Macabeo, 2023). In Pampanga, research at the barangay level highlighted limitations in road capacity, ineffective traffic control

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measures, and low compliance with traffic regulations—even when residents possess knowledge of the rules (Dela Peña et al., 2024)

Behavioral factors are also critical. A study in Metro Manila documented insufficient formal driver training and poor enforcement of traffic rules, suggesting that educational interventions promoting inter-driver cooperation could help mitigate congestion (De Ocampo et al., 2022). Taken together, these findings underscore that traffic congestion is a multifaceted problem, driven by infrastructure constraints, behavioral patterns, governance gaps, and modal imbalances—even down to the barangay level. This research aims to examine traffic congestion specifically in Sta. Cruz, Zamboanga City—a densely populated, economically active barangay—by exploring its underlying causes, assessing its socio-economic impacts, and proposing context-appropriate mitigation strategies.

Background of the Study

Traffic congestion has become a pressing urban challenge in many Philippine cities, with Zamboanga City being no exception. As one of the country's regional growth centers, Zamboanga has experienced steady increases in population, vehicle ownership, and economic activities, which have placed significant strain on its transportation system. In particular, Sta. Cruz, a densely populated and commercially active area, often experiences severe traffic bottlenecks that disrupt daily mobility, increase commuting costs, and reduce economic productivity (Moreno, 2023).

At the national level, the Department of Transportation (DOTr, 2019) reported that the Philippines continues to face mobility problems stemming from rapid motorization, inadequate road networks, and limited mass transit systems. These conditions mirror international studies indicating that congestion contributes to lost productivity, poor air quality, and heightened road accidents, disproportionately affecting low-income commuters who rely heavily on public transportation (De Ocampo et al., 2022).

Localized studies further highlight the importance of barangay-level assessments in addressing traffic issues. For example, Balla and Macabeo (2023) identified multiple contributory factors in the Bicol region, such as population growth, unregulated parking, and substandard infrastructure.

Similarly, Dela Peña et al. (2024) found that limited road capacity and weak compliance with traffic rules at the barangay level aggravated congestion in Pampanga, underscoring the need for stronger local government interventions. These findings align with Zamboanga's context, where fragmented traffic management and poor enforcement mechanisms contribute to recurring gridlocks.

Behavioral factors also play a role. A study in Metro Manila demonstrated that the absence of comprehensive driver education and weak enforcement of traffic laws worsened congestion, suggesting that policy responses should combine infrastructure improvements with behavioral and institutional reforms (De Ocampo et al., 2022).

For Sta. Cruz, Zamboanga City, the traffic problem has broader implications. Frequent congestion affects not only commuters but also businesses, logistics, and emergency responses. Increased travel times lead to economic losses, while prolonged exposure to vehicle emissions has adverse health impacts on residents (Litman, 2021). Without localized research and data-driven interventions, congestion in Sta. Cruz is likely to intensify as the barangay continues to urbanize and attract commercial activities.

This study is therefore both timely and necessary. By focusing on the specific conditions of Sta. Cruz, Zamboanga City, it seeks to provide evidence-based recommendations that will help local policymakers and planners develop efficient, community-specific traffic management strategies. In doing so, it contributes to the broader national agenda of sustainable urban development and aligns with the United Nations Sustainable Development Goals , particularly SDG 11 (Sustainable Cities and Communities) and SDG 9 (Industry, Innovation, and Infrastructure).

Objectives of the Study

General Objective

This study aims to analyze the extent and causes of traffic congestion in Barangay Sta. Cruz, Zamboanga City, and to evaluate its implications for Public Policy and Urban Planning.

Specific Objectives

Specifically, the study seeks to:

1. Assess the current traffic conditions in Barangay Sta. Cruz in terms of vehicle flow, volume, and peak-hour patterns.
2. Identify the socio-economic, infrastructural, and behavioral factors contributing to traffic congestion.
3. Evaluate existing traffic management measures and urban planning strategies implemented at the barangay and city levels.
4. Analyze the implications of traffic congestion on governance, public policy, and residents' quality of life.
5. Recommend evidence-based interventions for sustainable traffic management and urban planning tailored to Sta. Cruz, Zamboanga City.

Significance of the Study

This research holds importance for various reasons. To begin with, it delivers a detailed, localized analysis that complements broader traffic studies conducted at the national level. By examining traffic trends and

contributing factors at the barangay level, the study presents useful insights that can support more precise and effective decision-making in urban planning and policy development.

Additionally, the results of this study can assist local government units (LGUs), urban developers, and decision-makers in crafting tailored solutions that specifically address traffic congestion challenges in Sta. Cruz, Zamboanga City. Moreover, it may serve as a reference for conducting similar evaluations in other barangays, fostering a more data-informed and community-specific approach to traffic management. Lastly, the research adds to the existing literature on urban transportation by addressing the lack of localized traffic studies in smaller cities such as Zamboanga.

Scope and limitation

This study focuses on Sta. Cruz, Zamboanga City. It involves local stakeholders such as residents, business owners, public transport drivers, and barangay officials. The assessment covers traffic congestion levels, causes, and local policy interventions. The study does not include technical simulations of traffic or extend to adjacent barangays beyond Sta. Cruz Zamboanga City

Inclusion Criteria

The selection criteria for this study will be based on the participants' knowledge, experience, and direct involvement with traffic conditions and urban mobility in Sta. Cruz, Zamboanga City. Participants will include individuals who can provide relevant insights on vehicular flow, commuter behavior, and local governance strategies related to traffic management. A total of 30 participants will be purposively selected for in-depth interviews consisting of: Local government officials and barangay personnel involved in urban planning and traffic management; Representatives from the Zamboanga City Traffic Management Office (ZCTMO); Public transportation drivers and operators; Business owners affected by road congestion; and Residents and daily commuters within Barangay Sta. Cruz.

These participants are considered key informants who can provide diverse perspectives regarding traffic congestion, policy implementation, and its implications for urban mobility and quality of life. Additionally, a structured questionnaire survey will be distributed to approximately 30 respondents, consisting of residents, drivers, and commuters who experience the day-to-day traffic conditions within the study area.

Exclusion Criteria

This study excludes individuals who: do not reside, work, or regularly commute within Sta. Cruz, Zamboanga City, have limited or no awareness of local traffic conditions or city traffic policies, below 18 years old and therefore not legally eligible to provide informed consent and decline to participate or fail to complete the survey or interview process.

2. REVIEW OF RELATED LITERATURE

Traffic congestion has emerged as one of the most pressing challenges in rapidly urbanizing cities worldwide. Defined as the excess demand for road space that reduces the efficiency of vehicular movement (Patel & Kumar, 2021), congestion is both a transportation and governance issue. International studies demonstrate that congestion leads to decreased productivity, economic losses, and reduced quality of life (Zhang et al., 2022).

In the Philippine context, cities like Metro Manila, Cebu, and Zamboanga have experienced worsening congestion due to rapid population growth, increasing vehicle ownership, and weak transport governance (CPBRD, 2024; Bautista et al., 2022).

Current Traffic Conditions

International research underscores how urban centers worldwide grapple with heavy traffic during peak hours due to rising motorization and limited infrastructure (Zhang et al., 2022). Studies in Asian cities highlight recurring traffic bottlenecks linked to high vehicle volumes (Chen & Yu, 2021).

In the Philippines, Metro Manila consistently ranks among the world's most congested cities, with Filipinos losing an average of 188 hours annually to traffic (INRIX, 2023). Research in Cebu and Davao also points to road capacity limitations, growing vehicle registrations, and weak planning (Uy & Mendoza, 2020).

Locally, Zamboanga City experiences similar challenges. Moreno (2023) documented how Barangay Sta. Cruz has seen a significant rise in congestion during peak hours, particularly along major intersections. Bautista et al. (2022) further observed that public dissatisfaction stems from inefficient traffic flow and poorly managed road usage.

Contributing Factors: Socio-Economic, Infrastructural, and Behavioral

Socio-economic development is a key driver of traffic congestion. As household incomes rise, private vehicle ownership increases, creating additional strain on already limited road space (Fernandez et al., 2020). Infrastructural deficiencies also contribute to congestion. Poor road design, inadequate terminals, and limited pedestrian facilities often force informal practices that disrupt traffic (Uy & Mendoza, 2020; Garcia et al., 2021).

Behavioral factors likewise intensify congestion. Studies show that weak enforcement of traffic laws, informal parking practices, and non-compliance with regulations worsen road conditions (Johnson, 2020). Moreno (2023) highlighted that in Sta. Cruz, unregulated jeepney stops and tricycle terminals are

among the behavioral contributors to congestion.

Existing Traffic Management Measures and Urban Planning Strategies

Globally, cities have adopted both supply- and demand-side solutions to traffic congestion. Patel and Kumar (2021) note that while road expansion is a common response, sustainable strategies such as transport demand management and integrated land-use planning are increasingly favored.

In the Philippines, however, existing traffic management systems remain fragmented. Mayo et al. (2021) emphasized weak coordination among agencies, while a JICA (2020) study found that road widening often fails to address long-term demand.

At the local level, Zamboanga City ordinances regulating parking and traffic management have not been fully enforced, leading to limited impact (Rivera, 2021). Moreno (2023) observed that residents are dissatisfied with the lack of consistent enforcement. A 2025 study by Mapúa further argued that sustainable interventions, such as improved public transport, remain underdeveloped in Zamboanga.

Implications on Governance, Public Policy, and Quality of Life

Traffic congestion not only reduces mobility but also undermines governance. International studies show that inefficient transport systems reduce trust in local governments and hinder service delivery (Wang et al., 2022).

In the Philippines, congestion costs billions in lost productivity annually (CPBRD, 2024). Bautista et al. (2022) found that citizens view traffic problems as evidence of governance failure, while Fernandez et al. (2020) argue that urban livability is severely affected.

Locally, Moreno (2023) and Mapúa (2025) highlight that in Sta. Cruz, weak enforcement and ineffective ordinances create frustration among commuters, undermining governance credibility.

Theoretical Framework

This study is grounded on two key theories: Urban Mobility Theory and Systems Theory. Together, they help explain how and why traffic congestion occurs in Sta. Cruz, and how it can be addressed through effective policy and urban planning.

Urban Mobility Theory

Urban Mobility Theory focuses on how people and goods move efficiently within urban spaces and how this movement shapes the social and economic life of a city. It suggests that a city's success depends on how accessible and connected its transportation systems are, not simply on the speed of travel. In essence, mobility is about access—the ability of individuals to reach workplaces, schools, healthcare, and other essential services conveniently (Meyer & Meyer Jr., 2021).

From this perspective, traffic congestion in Sta. Cruz limits people's mobility and access to opportunities, leading to wasted time, reduced productivity, and overall lower quality of life. Urban Mobility Theory highlights that improving transportation systems goes beyond adding more roads—it requires understanding travel behavior, mode choices, and infrastructure design that encourages sustainable movement (Munkácsy et al., 2024).

Therefore, the theory supports this study by explaining how congestion is not only a logistical issue but also a reflection of mobility inequality and urban planning inefficiency.

Systems Theory

Systems Theory, first proposed by Ludwig von Bertalanffy in the mid-20th century, provides a framework for understanding how different components of a system interact to create an overall outcome. When applied to urban transportation, it explains that traffic congestion is not caused by a single factor but by the interdependence of multiple elements—such as infrastructure, vehicle volume, commuter behavior, policy enforcement, and land-use planning (Mylonakou et al., 2023). In Sta. Cruz, this means congestion arises from a complex mix of road design, driver discipline, parking practices, and limited public transport options. Systems Theory reminds policymakers and planners that improving one part of the system—like widening a road—will only have temporary effects unless other subsystems (such as traffic management and public transport) are also improved. It encourages holistic and evidence-based approaches that view the city as an interconnected ecosystem (World Economic Forum, 2024).

Integration of Theories

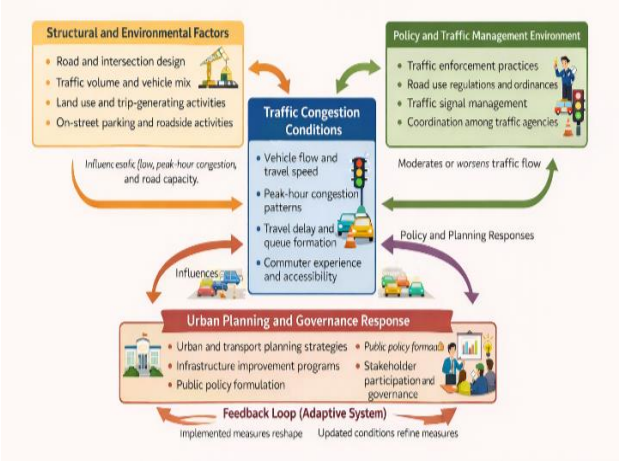
By combining Urban Mobility Theory and Systems Theory, this study captures both the functional and systemic sides of the traffic problem. Urban Mobility Theory explains what the city aims to achieve—efficient, equitable movement—while Systems Theory explains how each factor contributes to or hinders that goal. Together, these theories provide a comprehensive framework to analyze traffic congestion in Sta. Cruz, identify root causes, and propose policy and planning solutions that promote sustainable mobility.

Conceptual Framework

This study is guided by **Baya's Integrated Urban Traffic Systems Framework**, anchored on Mobility Theory and Systems Theory. The framework conceptualizes traffic congestion in Sta. Cruz, Zamboanga City as a dynamic outcome of interactions among human and behavioral factors, infrastructure and environmental systems, traffic management and policy mechanisms, and urban planning and governance processes. Through a systems perspective, the

framework highlights how policy and planning responses act as feedback mechanisms that continuously shape mobility outcomes and traffic conditions.

Figure 1
***Assessment of Traffic Congestion in Sta. Cruz, Zamboanga City: Implications for Public Policy and Urban Planning* (Baya's Integrated Urban Traffic Systems Model, 2025)**



Variables to be Investigated

The independent variables to be examined in this study include governance and policy mechanisms, infrastructure and engineering factors, and human and behavioral influences related to traffic use and management. These variables represent the key elements that shape traffic conditions in Sta. Cruz, Zamboanga City.

On the other hand, the dependent variable of the study is traffic congestion and mobility performance, which encompasses travel delays, traffic flow efficiency, and commuter experience. The interaction of the identified independent variables is expected to influence traffic congestion levels and will ultimately inform public policy decisions and urban planning interventions aimed at improving mobility and managing congestion in the study area.

3. RESEARCH METHODOLOGY

Research Design

This study employs a convergent mixed-methods design, combining both quantitative and qualitative approaches to comprehensively analyze the extent, causes, and implications of traffic congestion in Sta. Cruz, Zamboanga City. The quantitative component gathers numerical data on vehicle flow, traffic volume, and peak-hour congestion patterns through structured surveys and traffic counts. The qualitative component explores the underlying socio-economic, infrastructural, and behavioral factors through in-depth interviews, and document analysis. The mixed-methods approach enables triangulation—comparing and merging numerical patterns with stakeholder insights—to provide a well-rounded understanding of traffic conditions and policy implications. This design is particularly suited for transport and planning studies where technical measurements and human perceptions must be interpreted together (Braun & Clarke, 2023; Palinkas et al., 2020; Mouratidis,2023).

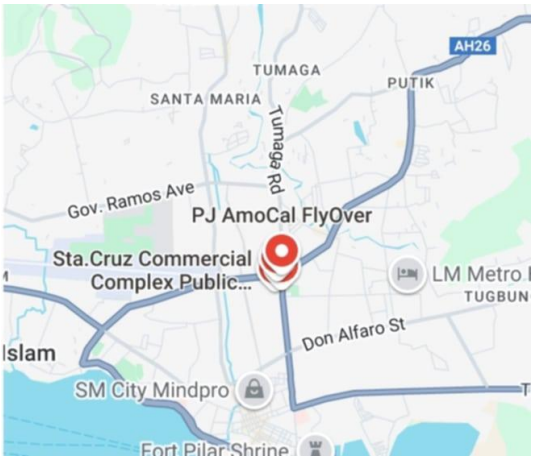
Target Population

The population of this study includes all individuals and entities directly affected by or involved in traffic flow within Sta. Cruz, Zamboanga City. These comprise: local residents who experience daily traffic within the barangay; Commuters and motorists who regularly traverse the area; Business owners and employees operating within the commercial zones; Barangay officials and traffic enforcers responsible for local traffic regulation; and Representatives from the Zamboanga City Traffic Management Office (ZCTMO) and other relevant agencies.

Research locale

The study will be conducted in Sta. Cruz, Zamboanga City, one of the city's busiest commercial and residential districts. The area is characterized by high vehicular density, narrow road networks, and mixed land use—conditions that make it a critical location for analyzing urban traffic congestion. Zamboanga City, located in the Zamboanga Peninsula of Western Mindanao, serves as a regional economic hub. Sta. Cruz experiences heavy daily traffic flow due to its proximity to business establishments, educational institutions, and transport terminals, making it a representative microcosm of the city's overall mobility challenges.

Figure 2
Spot Map Locale. Sta, Cruz Zamboanga City



Data Sources and Respondents of the Study

This study utilized primary sources to comprehensively assess traffic congestion in Sta. Cruz, Zamboanga City. Primary data were obtained through structured survey questionnaires and Key Informant Interviews (KII) administered to purposively selected respondents who are directly affected by or involved in

traffic flow and traffic management within the study area. The respondents included residents and regular commuters of Sta. Cruz, public transport drivers and operators, traffic enforcers, and local officials, as well as representatives from relevant government agencies such as the Zamboanga City Traffic Management Office (ZCTMO), the Land Transportation Franchising and Regulatory Board (LTFRB), and barangay officials of Barangay Camino Nuevo. These participants were chosen due to their firsthand experience and institutional knowledge regarding traffic conditions, enforcement challenges, and urban planning concerns.

Research Instruments

The research instruments utilized in this study include:

1. Structured Questionnaires- A representative sample of residents, drivers, and commuters from Sta. Cruz will be surveyed using a structured questionnaire. The instrument will include both closed- and open-ended questions designed to collect data on: Daily commuting patterns, Vehicle ownership, Perceptions of road congestion, Satisfaction with existing traffic management measures, and Suggestions for improvement. The questionnaires will be administered in person to ensure a high response rate and clarify any items that may be misunderstood by respondents.

2. Key Informant Interviews- In-depth, semi-structured interviews will be conducted with key stakeholders directly involved in urban transport and policy implementation. These include Officials from the Zamboanga City Traffic Management Office (ZCTMO) and Sta. Cruz Council, Representatives from the Land Transportation and Franchising and Regulatory Board (LTFRB) affected by traffic congestion.

The interviews aim to gather insights into existing challenges, strategies, and governance approaches related to traffic control, infrastructure planning, and public policy integration. Open-ended questions will allow respondents to elaborate on their experiences and propose feasible policy solutions

Sampling Method:

In this study, **purposive sampling** was employed to select information-rich participants who are directly involved in or affected by traffic conditions in Sta. Cruz Zamboanga City. Purposive sampling is a form of non-probability sampling where participants are chosen intentionally based on their relevance and experience with the research phenomenon rather than random selection. This method is especially appropriate for qualitative and mixed-methods research that seeks depth and specificity of understanding rather than statistical generalization (Nyimbili & Nyimbili, 2024; Ahmad & Wilkins, 2025). Purposive sampling allows the researcher to select key informants such as traffic management officials, transport regulators, barangay leaders, and regular commuters who possess essential insights on traffic congestion and policy implementation (Nyimbili & Nyimbili, 2024; Ahmad & Wilkins, 2025).

Sample Size:

This study involved a total sample size of approximately 30 respondents, comprising both survey respondents and 3 key informants. The sample size was considered appropriate given the descriptive–analytical and mixed-methods design of the study, which emphasizes contextual understanding and policy-relevant insights rather than statistical generalization.

Data Collection Procedure

The data collection process for this study was conducted systematically to ensure accuracy, reliability, and ethical integrity. Prior to data gathering, the researcher prepared the survey questionnaire and Key Informant Interview (KII) guide based on the study objectives and reviewed relevant literature on traffic congestion and urban planning. The research instruments were validated through consultation with academic advisers and experts in public administration and urban governance.Permission to conduct the study was formally requested from the concerned offices, including the barangay officials of Barangay Camino Nuevo, the Zamboanga City Traffic Management Office (ZCTMO), and the Land Transportation Franchising and Regulatory Board (LTFRB). Upon approval, the researcher proceeded with the data collection.

For the **survey component**, structured questionnaires were administered to selected residents, commuters, drivers, and traffic enforcers who regularly traverse Sta. Cruz. Due to varying levels of digital literacy among respondents, the questionnaires were answered either directly by the respondents or encoded by the researcher based on their verbal responses. This approach ensured inclusivity and completeness of responses while maintaining the accuracy of the data collected.

For the **Key Informant Interviews**, face-to-face and scheduled interviews were conducted with purposively selected officials and personnel from ZCTMO, LTFRB, and the barangay official. The interviews followed a semi-structured format, allowing respondents to freely express their insights on traffic conditions, enforcement challenges, and policy implications. With consent, responses were documented through note-taking to preserve the original narratives. All respondents were informed of the purpose of the study, assured of confidentiality, and advised that their participation was voluntary. No personal identifiers were included in the data collection instruments.

Data Treatment and Analysis

After data collection, the responses from the survey questionnaires and Key Informant Interviews were carefully organized, cleaned, and prepared for analysis. Survey responses were reviewed to check for completeness, consistency, and accuracy. Incomplete or unclear responses were noted, and only valid responses

were included in the final analysis.

Survey data were coded by assigning numerical values to categorical and Likert-scale responses. These coded data were then encoded into **Jamovi** for statistical processing. Descriptive statistical techniques such as **frequencies, percentages, and measures of central tendency (mean and median)** were used to summarize respondents' perceptions of traffic conditions, contributing factors, effectiveness of traffic management measures, and impacts on quality of life. The results were presented in the form of tables to highlight key patterns and trends relevant to the study objectives.

For the qualitative data obtained from the Key Informant Interviews, **thematic analysis** was employed. The recorded responses were reviewed multiple times to identify recurring ideas, patterns, and issues related to traffic congestion and urban planning. These recurring ideas were grouped into themes such as causes of congestion, enforcement challenges, infrastructural limitations, and policy recommendations. The qualitative findings were summarized in thematic tables and supported by selected direct statements from informants to enrich interpretation.

Finally, **triangulation** was applied by comparing and integrating the findings from the survey, KII. This process enhanced the credibility of the results by identifying areas of convergence and divergence among different data sources. The integrated analysis provided a comprehensive basis for drawing conclusions and formulating policy-relevant recommendations for improving traffic management and urban planning in Sta. Cruz, Zamboanga City.

4. RESULTS AND DISCUSSIONS

The findings reveal that traffic congestion in Sta. Cruz is a **persistent and significant condition rather than an occasional inconvenience**. A majority of respondents (36.7%) described congestion as *heavy*, while an additional 10.0% classified it as *very heavy*. Only a small portion experienced very light congestion. The computed mean congestion level (M = 3.13) further confirms that congestion is generally experienced at the higher end of the scale in terms of temporal patterns, congestion is most pronounced during the **afternoon peak hours (46.7%)**, followed by morning (26.7%) and evening (23.3%). This pattern suggests that traffic congestion is strongly associated with **school dismissals, work-related travel, and commercial activities**, particularly in areas serving as access points to markets and malls. These results directly address the first objective by establishing both the **severity and timing of congestion** in Sta. Cruz.

Frequency and Travel Time Impacts

Congestion is not only severe but also **frequent**. Half of the respondents (50.0%) reported that congestion *always* occurs, while another 16.7% experience it *often*. This indicates that congestion has become a **routine condition of daily mobility**, rather than an episodic event. The consequences of this congestion are evident in travel delays. Most respondents (66.7%) reported experiencing **10–20 minutes of additional travel time**, while 20.0% experienced delays of up to 40 minutes or more. These delays reflect inefficiencies in traffic flow and directly affect productivity, access to services, and daily schedules, reinforcing congestion as a pressing urban management issue.

Contributing Factors to Traffic Congestion

Respondents overwhelmingly identified **narrow roads (63.3%)** as the primary cause of congestion, highlighting a major **infrastructural constraint** in Sta. Cruz. Behavioral and operational factors such as illegal parking (13.3%) and public transport stops (13.3%) were also notable contributors. Interestingly, the number of vehicles itself was least cited, suggesting that congestion stems more from **road design and management limitations** than from sheer traffic volume. Transport usage patterns further contextualize these findings. Nearly half of respondents (46.7%) rely mostly on **private vehicles**, while only 33.3% primarily use public transport. This preference may reflect perceived inadequacies in public transport reliability and convenience, which in turn contributes to increased road space competition. Moreover, only 30.0% of respondents believed that alternative routes were sufficient, while a large proportion (43.3%) were unsure. This uncertainty indicates **poor route connectivity, limited traffic information, or inadequate road network planning**, compounding congestion problems.

Traffic Management, Compliance, and Governance

Traffic governance and enforcement emerged as **moderately weak** in the perception of residents. While some respondents acknowledged the presence of traffic enforcers, only half believed they were consistently sufficient. Compliance with traffic rules was also low, with most respondents indicating that rules are followed only *sometimes* or *rarely*.

Notably, 66.7% of respondents rated traffic management effectiveness as *neutral*, and 26.7% found it *ineffective*. This suggests that existing measures may exist in form but **lack visibility, consistency, or impact** in practice. Similarly, perceptions of traffic ordinance implementation were evenly split between *well implemented* and *not implemented*, revealing a governance gap between policy formulation and enforcement. These findings strongly support the third and fourth objectives by demonstrating how **institutional capacity, enforcement behavior, and policy execution** influence congestion outcomes.

Implications for Quality of Life and Public Policy

Traffic congestion has tangible social consequences. Nearly half of the respondents (46.7%) reported that congestion **moderately affects their quality of life**, while 16.7% experienced significant impacts. These effects likely include stress, lost time, reduced economic productivity, and diminished access to essential services. From a governance perspective, an overwhelming 90.0% of respondents viewed traffic congestion as a **government issue**, indicating strong public expectations for state intervention. However, confidence in city-level interventions remains limited, with 63.3% expressing neutral confidence. This mismatch highlights a **trust and performance gap** in urban traffic governance. Spatially, congestion is most severe along the **road going to KCC (40.0%)** and Veterans Avenue (26.7%), confirming that congestion hotspots are concentrated around major commercial corridors. This spatial concentration underscores the need for **area-specific planning interventions** rather than uniform, citywide solutions.

The thematic analysis of Key Informant Interviews (KIIs) with officials from LTFRB, the Barangay, and ZCTMO, complemented by quantitative survey results from residents of Sta. Cruz. The findings collectively examine the **extent, causes, and governance implications of traffic congestion**, and assess the **effectiveness of current traffic management and urban planning interventions**, consistent with the study's objectives.

Table 1
Alignment of Research Objectives and Emergent Themes

Specific Objectives	Key themes Identified	Alignment Explanation
1.Assess current traffic conditions in Barangay Sta. Cruz in terms of vehicle flow, volume, and peak-hour patterns.	**Overall traffic condition; Traffic trends over the years; Peak-hour congestion; Main road congestion**	**These themes describe the intensity, timing, and spatial concentration of traffic congestion, allowing an assessment of traffic flow and peak-hour patterns based on stakeholder perceptions.**
2. Identify socio-economic, infrastructural, and behavioral factors contributing to traffic congestion	**Poor traffic discipline; Public non-compliance; Weak enforcement; Road inadequacy; Infrastructure limitations**	**The themes reflect behavioral (discipline, compliance), infrastructural (road conditions, capacity), and governance-related socio-economic factors influencing congestion.**
3. Evaluate existing traffic management measures and urban planning strategies at the barangay and city levels	**Traffic management and urban planning; Enforcement challenges; Inter-agency coordination; Existing traffic regulations**	**These themes evaluate both the presence and effectiveness of current traffic policies and planning strategies, highlighting implementation gaps.**
4. Analyze the implications of traffic congestion on governance, public policy, and residents' quality of life	**Governance challenges; Policy implementation gaps; Public dissatisfaction; Safety and mobility concerns**	**The themes illustrate how congestion affects governance efficiency, policy enforcement, and residents' daily experiences, including safety, convenience, and mobility.**
5. Recommend evidence-based interventions for sustainable traffic management and urban planning	**Proposed reforms; Infrastructure improvement; Strict enforcement; Traffic discipline enhancement**	**These themes directly inform practical, evidence-based recommendations grounded in the identified problems and existing policy gaps.**

Theme 1: Extent and Nature of Traffic Congestion in Sta. Cruz Zamboanga City

Both qualitative and quantitative data indicate that traffic congestion in Sta. Cruz is a **persistent and structurally embedded issue**. All key informants consistently described overall traffic conditions as **moderately congested**, suggesting that congestion is not episodic but part of daily mobility patterns. Survey findings reinforce this perception, with **50% of respondents reporting that congestion occurs "always"**, and an additional **16.7% indicating it**

occurs "often."

Peak-hour analysis reveals that congestion is most pronounced during the **afternoon (46.7%)**, followed by morning and evening periods, reflecting a convergence of work-related travel, school dismissals, and commercial activity. The **mean congestion frequency score (3.13)** and **median of 3.5** further suggest that congestion leans toward the heavier end of the scale rather than being occasional.

Spatially, congestion is concentrated along **major road corridors**, particularly the **road leading to KCC**, Veterans Avenue, and areas near the public market. These findings highlight that congestion in Sta. Cruz is **location-specific and infrastructure-dependent**, rather than evenly distributed across the barangay.

Theme 2: Infrastructural and Physical Drivers of Congestion

Infrastructure limitations emerged as the **dominant structural cause** of congestion. Narrow roads were identified by **63.3% of survey respondents** as the primary contributor, a finding echoed by two of the three key informants. The concentration of traffic along major roads, coupled with limited road width and insufficient alternative routes, creates chronic bottlenecks.

Perceptions of infrastructure adequacy, however, were **institutionally fragmented**. While the LTFRB representative considered existing infrastructure adequate, both the barangay official and ZCTMO assessed it as **inadequate**, reflecting a gap between regulatory and operational perspectives. This divergence suggests that infrastructure assessments may not fully capture on-the-ground traffic realities experienced by local enforcers and residents.

The limited sufficiency of alternative routes—where **43.3% of respondents were unsure and 26.7% believed none were adequate**—further underscores the barangays structural vulnerability to congestion. Without viable route options, traffic volume is forced onto the same corridors regardless of time of day or incidents.

Theme 3: Behavioral and Socio-Economic Factors

Beyond physical constraints, **behavioral factors significantly exacerbate congestion**. Poor traffic discipline, illegal parking, non-compliance with traffic rules, and improper public transport stops were repeatedly cited. Survey data show that only **10% of respondents often comply with traffic rules**, while nearly **50% report never or rarely complying**, indicating weak normative adherence to traffic regulations.

Public transport dependency also contributes to congestion pressure. While private vehicle use remains dominant (46.7%), a substantial proportion of residents rely on public transport or a mix of both. Inadequately regulated loading and unloading practices near markets and commercial areas intensify road obstruction, especially during peak hours.

These findings indicate that congestion in Sta. Cruz is not solely an engineering problem but also a **behavioral governance challenge**, requiring interventions that address road user behavior alongside infrastructure.

Theme 4: Effectiveness of Traffic Management and Policy Implementation

Perceptions of traffic policy effectiveness varied across institutions but generally leaned toward **moderate effectiveness**. While LTFRB and ZCTMO officials described traffic policies as very effective, the barangay official assessed them as only somewhat effective. Survey results mirror this ambivalence, with **66.7% of respondents rating traffic management as neutral** and **26.7% as ineffective**.

Enforcement capacity emerged as a key limiting factor. Although half of the respondents believed traffic enforcers were sufficient, **lack of personnel** and **public non-compliance** were identified as major enforcement challenges by key informants. This suggests that enforcement effectiveness is constrained less by policy design and more by **implementation capacity and public cooperation**. Coordination among agencies also revealed inconsistencies. While ZCTMO reported strong inter-agency coordination, LTFRB described it as weak. Such institutional misalignment may undermine coherent traffic governance and dilute accountability across agencies.

Theme 5: Urban Planning Integration and Long-Term Traffic Trends

Most key informants acknowledged that traffic management is integrated into urban planning, though implementation remains uneven. The barangay official described this integration as partial, indicating gaps between planning frameworks and actual execution.

Traffic trend assessments suggest **modest improvement over time**, as reported by two of the three key informants. However, the absence of significant change noted by LTFRB and the continued high frequency of congestion reported by residents imply that improvements have not been substantial enough to alter daily traffic experiences.

This indicates that while planning initiatives exist, they may lack the scale, enforcement, or infrastructure support necessary to generate trans-formative outcomes.

Theme 6: Governance and Quality-of-Life Implications

Traffic congestion has clear implications for governance and residents' quality of life. A majority of respondents (**90%**) identified traffic congestion as a **government issue**, reflecting high public expectations for state intervention. Moreover, **63.4% of respondents reported moderate to significant impacts on quality of life**, including longer travel times, daily stress, and

reduced productivity.

Despite this, confidence in city-level interventions remains largely neutral, suggesting **public skepticism rather than outright rejection** of government efforts. This neutral stance reflects an opportunity for policy improvement through visible, well-communicated, and community-engaged interventions

Zamboanga City through a triangulation of **key informant interviews (KIIs)** and **community survey data**, allowing for a more comprehensive and credible understanding of the issue. The convergence of institutional perspectives and lived experiences reveals that traffic congestion in Sta. Cruz is a **persistent, multi-dimensional urban problem** shaped by infrastructural limitations, behavioral factors, and governance constraints.

Across all key informants—LTFRB, barangay officials, and ZCTMO—there was consensus that traffic conditions in Sta. Cruz are **moderately congested**, particularly along major roads and commercial zones. This institutional assessment is strongly supported by survey data, where the majority of residents reported experiencing congestion **frequently or consistently**, especially during **afternoon peak hours**. The alignment of these data sources confirms that congestion is not perceived in isolation but is a shared and observable condition affecting daily mobility.

In terms of causation, both qualitative and quantitative data converge on **narrow road infrastructure** as the primary physical driver of congestion. Survey respondents overwhelmingly identified narrow roads as the main cause, while key informants linked congestion to the concentration of traffic along major corridors and market areas. Behavioral factors—such as poor traffic discipline, illegal parking, and non-compliance with regulations—emerged as reinforcing mechanisms that intensify existing infrastructural constraints. While institutional actors emphasized enforcement challenges, residents' low levels of reported traffic rule compliance validated these concerns from the ground level.

The evaluation of traffic management and policy effectiveness revealed **partial alignment but uneven implementation**. Key informants generally viewed traffic policies as effective, particularly at the regulatory level; however, residents expressed largely neutral or negative perceptions of traffic management outcomes. This divergence suggests that while policies may be technically sound, their **on-the-ground impact is diluted by limited enforcement capacity, inconsistent coordination, and weak public adherence**.

Finally, both data sources highlight the broader consequences of congestion on **quality of life and governance**. Residents reported moderate to significant disruptions in daily routines and travel time, while the vast majority identified traffic congestion as a government responsibility. Despite some acknowledgment of improvements over time, public confidence in city interventions remains cautious, pointing to a gap between policy intent and visible outcomes.

5. CONCLUSION AND POLICY RECOMMENDATIONS

Conclusion

Based on the triangulated findings, several key conclusions can be drawn.

First, traffic congestion in Sta. Cruz is a **structural and systemic issue**, rather than a temporary or situational problem. The persistence of congestion across time, locations, and peak periods indicates that existing road capacity and urban design are insufficient to meet current mobility demands.

Second, infrastructure deficiencies and behavioral non-compliance interact to produce congestion. Narrow roads alone do not fully explain traffic conditions; rather, congestion is intensified by weak traffic discipline, poorly regulated public transport operations, and illegal parking practices. Addressing congestion therefore requires both **physical upgrades and behavioral governance**.

Third, while traffic management policies and urban planning initiatives exist, their effectiveness is constrained by **implementation gaps**. Differences in institutional assessments of infrastructure adequacy, enforcement challenges, and inter-agency coordination suggest fragmented governance. Without stronger alignment among agencies and clearer operational integration, policy outcomes remain limited.

Fourth, traffic congestion has tangible implications for residents' **quality of life and trust in governance**. Delays, increased travel time, and daily stress have normalized congestion as part of everyday life, reinforcing public expectations for government action while simultaneously fostering skepticism toward existing interventions.

Proposed Policy Recommendation

The findings of this study carry important implications for public policy and urban planning at both the barangay and city levels.

Infrastructure-Led but Context-Sensitive Planning

Traffic policy must prioritize **road redesign and widening** in congestion-prone corridors, particularly near markets and commercial centers. However, infrastructure expansion should be guided by localized traffic data and barangay-level realities to avoid one-size-fits-all solutions. Developing functional alternative routes is essential to dispersing traffic volume and reducing dependence on major roads.

Strengthening Enforcement Capacity and Consistency

The effectiveness of traffic policies depends heavily on enforcement. Addressing personnel shortages, improving deployment during peak hours, and ensuring consistent application of traffic rules can significantly improve compliance. Enforcement should be visible, predictable, and supported by clear institutional coordination.

Behavioral Change as a Policy Priority

Traffic congestion in Sta. Cruz cannot be resolved through infrastructure and enforcement alone. Public awareness campaigns, community engagement, and driver education programs must be institutionalized as part of traffic policy. Encouraging voluntary compliance can reduce enforcement burden and foster shared responsibility among road users.

Integrated Urban Planning and Transport Governance

Traffic management must be fully embedded within urban planning processes. Aligning barangay-level development decisions with city-wide transport strategies—such as the adoption of a localized Public Transport Management Plan (PTMP)—can help ensure that land use, transport routes, and traffic control measures are mutually reinforcing.

Enhancing Public Trust through Transparency and Participation

Given the strong perception of congestion as a governance issue, policymakers must improve communication and stakeholder participation. Involving residents, transport operators, and local businesses in planning and decision-making can increase policy legitimacy, public trust, and long-term compliance.

Targeted Road Redesign and Selective Widening

Given the dominance of narrow roads as a congestion cause, localized road widening, intersection redesign, and removal of bottlenecks—especially along the KCC access road—should be prioritized rather than broad, costly expansions.

Strict Enforcement of Parking Regulations

Illegal parking emerged as a key behavioral contributor. Implementing a clearly marked **no-parking policy**, supported by penalties and towing operations, would immediately improve road capacity without new infrastructure.

Strengthened Traffic Enforcement and Visibility

Increasing the number of traffic enforcers during peak hours, combined with consistent enforcement, would improve compliance and restore public confidence in traffic governance.

Improved Public Transport Management

Regulating public transport stops and improving service reliability may reduce private vehicle dependence and prevent roadside loading-related congestion

One-Way Traffic Schemes and Alternative Route Development

Introducing one-way systems in congested corridors and improving signage and public awareness of alternative routes can enhance traffic flow efficiency.

Community Awareness and Participation Programs

Educational campaigns on traffic discipline and shared road responsibility can address behavioral causes and foster community cooperation.

Based on the thematic findings, the following policy recommendations are proposed:

Infrastructure-Oriented Interventions

Prioritize road widening and redesign along major congestion corridors, particularly near markets and commercial zones and develop and clearly signpost **alternative routes** to reduce pressure on primary roads

Strengthened Traffic Enforcement

Increase the number of trained traffic enforcers and deploy them strategically during peak hours and implement **stricter enforcement of no-parking and loading/unloading regulations**, especially near public markets.

Behavioral and Public Awareness Programs

Launch sustained **community-based traffic education campaigns** to improve compliance and road discipline and engage transport operators and drivers as partners in enforcement rather than solely as subjects of regulation.

Integrated Traffic and Urban Planning

Fully adopt and localize the **Public Transport Management Plan (PTMP)** to align transport routes with land-use patterns and ensure that barangay-level planning is consistently integrated into city-wide transport strategies.

Institutional Coordination and Governance

Establish a formal **inter-agency coordination mechanism** among LTFRB, ZCTMO, and barangay authorities to harmonize enforcement, data sharing, and policy implementation and improve transparency and public communication to enhance trust and confidence in government interventions.

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