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Methodology to manage mobility factors and optimize university transportation in the Ecuadorian context

Metodología para gestionar factores de movilidad y optimizar el transporte universitario en el contexto ecuatoriano

Metodologia para gerenciar fatores de mobilidade e otimizar o transporte universitário no contexto equatoriano

Abstract

Introduction: the study analyzes the transportation needs of the university community at the Centenario campus of the Salesian Polytechnic University in Guayaquil, which houses 5,011 people, considering mobility factors that affect their safety and well-being. **Objective:** to determine mobility factors and propose solutions to optimize the university transportation system. **Method:** the research employed a mixed approach with surveys, interviews, and statistical analysis applied to a sample of 357 people, evaluating accessibility, costs, schedules, safety, and comfort. **Results:** a high dependence on public transport, high costs, perceived insecurity, and lack of comfort were identified, along with peak demand hours and areas with a high concentration of users. Interviews with authorities revealed infrastructure problems and insufficient security measures. **Conclusion:** the implementation of a sustainable and efficient transportation system is proposed to address the identified needs, promote shared transportation, and reduce costs, improving the mobility experience of the university community.

Keywords: university-transportation, mobility, methodology, insecurity, sustainability

Resumen

Introducción: el estudio analiza las necesidades de transporte en la comunidad universitaria del campus Centenario de la Universidad Politécnica Salesiana en Guayaquil, que alberga a 5,011 personas, considerando factores de movilidad que afectan su seguridad y bienestar. **Objetivo:** determinar los factores de movilidad y proponer soluciones para optimizar el sistema de transporte universitario.



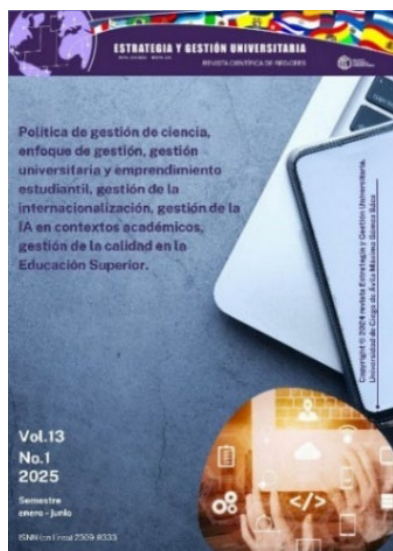
Método: la investigación empleó un enfoque mixto con encuestas, entrevistas y análisis estadísticos aplicados a una muestra de 357 personas, evaluando accesibilidad, costos, horarios, seguridad y comodidad. **Resultados:** se identificó una alta dependencia del transporte público, costos elevados, percepción de inseguridad y falta de comodidad, así como horarios de mayor demanda y sectores con alta concentración de usuarios. las entrevistas con autoridades revelaron problemas de infraestructura y medidas de seguridad insuficientes. **Conclusión:** se propone la implementación de un sistema de transporte sostenible y eficiente que responda a las necesidades detectadas, fomente el uso compartido de vehículos y reduzca costos, mejorando la movilidad de la comunidad universitaria.

Palabras clave: universidad-transporte, movilidad, metodología, inseguridad, sostenible

Resumo

Introdução: o estudo analisa as necessidades de transporte da comunidade universitária do campus Centenario da Universidade Politécnica Salesiana de Guayaquil, que abriga 5.011 pessoas, considerando os fatores de mobilidade que afetam sua segurança e bem-estar. **Objetivo:** determinar os fatores de mobilidade e propor soluções para otimizar o sistema de transporte universitário. **Método:** a pesquisa empregou uma abordagem mista com pesquisas, entrevistas e análise estatística aplicada a uma amostra de 357 pessoas, avaliando a acessibilidade, os custos, os horários, a segurança e o conforto. **Resultados:** foi identificada uma alta dependência do transporte público, altos custos, percepção de insegurança e falta de conforto, bem como horários de alta demanda e setores com alta concentração de usuários. entrevistas com autoridades revelaram problemas de infraestrutura e medidas de segurança insuficientes. **Conclusão:** propõe-se a implementação de um sistema de transporte sustentável e eficiente que atenda às necessidades detectadas, promova a carona solidária e reduza os custos, melhorando a mobilidade da comunidade universitária.

Palavras-chave: universidade-transporte, mobilidade, metodologia, insegurança, sustentável



Introduction

Mobility in Guayaquil has been compromised due to the significant increase in the number of vehicles. According to the Association of Automotive Companies of Ecuador (AEADE, 2023), vehicle sales have increased by 50% in the last three years. This increase has contributed to environmental deterioration (Colville et al., 2001). The lack of an adequate transportation system directly affects university management processes, such as the efficient allocation of resources, the scheduling of academic and administrative activities, and the quality of the educational environment.

On an annual basis, private vehicles emit 136 tons of CO, 1662 tons of CO₂, and 12 tons of NO_x; cabs emit 82 tons of CO, 451 tons of CO₂, and 0.019 tons of NO_x, while buses emit 5 tons of CO, 1870 tons of CO₂, and 22 tons of NO_x (Gulia et al., 2015; Patiño-Aroca et al., 2022). The situation is aggravated by the high rates of violence and robbery in the country, which generates psychosocial discomfort (Andrade, 2023; Vemi, 2023). These factors condition management within the university context.

The perception of insecurity is not only present during the various processes of mobility but fear also thrives when there are other factors that exacerbate it, regardless of whether or not the country is underdeveloped, affecting the availability, rates, and other factors related to travel. In this context, the Salesian Polytechnic University Centenario Campus has 410 parking lots, which are collapsed due to the high influx of vehicles, motivating the search for methods that allow mobilization in a safe and efficient manner (González Quiñones et al., 2018; Huertas et al., 2021). Obtaining relevant results and with significant impact on improvement using the e-learning methodology, it is evident that online surveys have supported effective results (López Chila et al., 2023).

Given this scenario, the need arises to conduct a study to determine the transportation needs in the Centenario Campus. This study aims to obtain information using data collection methods such as surveys and interviews, with the use of digital resources and improved performance integration, with the purpose of developing a guide to propose possible solutions through the optimization of a transportation system that benefits the members of the University community (López-Chila et al., 2023). This as part of the social responsibility pursued by every organization (Cueva et al., 2021).

The different alternatives to address this problem include carpooling strategies, route optimization, schedule optimization, and cost optimization strategies. Although all these proposals address different contexts, they are complex for individuals who cannot adapt them to their specific requirements. However, the intention is to identify the requirements of the personnel that make up the Centennial Campus through different criteria.

Needs can be described as the deficiencies or requirements that arise from the intrinsic nature of human beings and can be satisfied to maintain a state of optimal physical, social, and emotional well-being (Fong-Amaris et al., 2022). According to Flores et al. (2022), this need is met through the use of different modes of transportation. Displacement can be exercised through means of transportation

such as buses, private vehicles, walking, or bicycles to satisfy the need to move from one point to another. Urban mobility is not possible without a need to be satisfied. This underscores the need to integrate mobility strategies into institutional management, addressing aspects such as route optimization, sustainability and safety, in order to strengthen the quality of educational and administrative processes.

Sustainable mobility refers to an approach to transportation planning and management that seeks to minimize environmental impacts and promote efficiency, safety, and equity in the movement of people and goods. This approach is based on the integration of various modes of transport, such as public transport, active mobility (walking and cycling), and the incorporation of environmental limits, aiming to reduce dependence on fossil fuel vehicles and encourage the adoption of cleaner and more efficient technologies (Guillamón & Hoyos, 2023). Mobility at the Salesian Polytechnic University, Centenario campus, represents a challenge that impacts university management in terms of accessibility, equity and sustainability. The high number of vehicles, combined with problems of insecurity and transportation costs, affects the fulfillment of schedules, academic planning and the well-being of the university community.

According to Zambrano et al. (2020), the implementation of intelligent transportation systems in cities such as Quito has demonstrated improvements in traffic management and mobility decision making. Transportation is a key sector that contributes significantly to environmental problems, especially in terms of emissions. As developing countries move towards a more sustainable future, hybrid vehicles, especially hybrid electric vehicles with CNG (PH-CNG-EVs), are playing a crucial role, although their optimization and modeling have not been sufficiently studied (Lin, Qi, & Ma, 2025).

Sustainable transportation planning in university communities is a key challenge to mitigate traffic externalities. According to Alogdianakis et al. (2024), the implementation of credit schemes can encourage the use of sustainable mobility options, such as public transport and carpooling, while discouraging single-occupant car trips. Their study highlights that parking pricing schemes are most effective when introduced gradually and when combined with incentives for sustainable transport use.

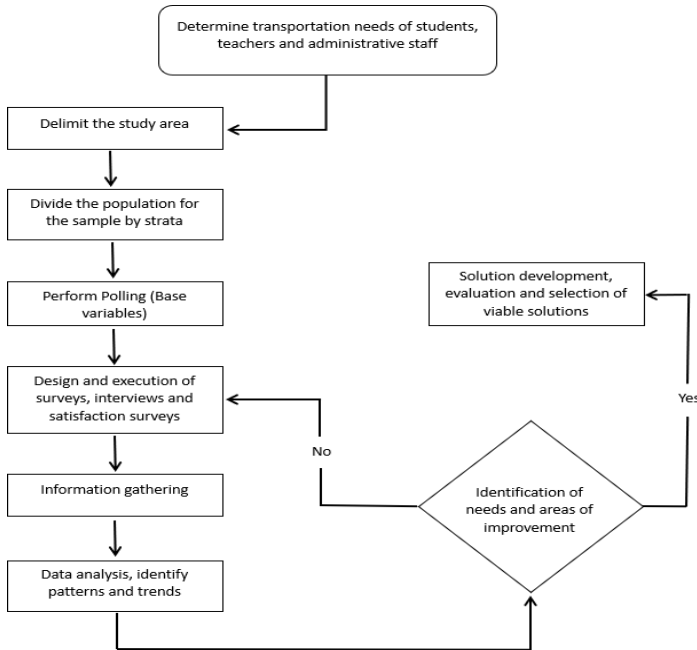
Methods and materials

The present study is carried out in a polytechnic university in the city of Guayaquil, Ecuador. According to the research of Paredes et al. (2019) and Hernández Sampieri et al. (2014), it focuses on the application of quantitative and qualitative methods, which implies the systematization of processes, as detailed in Figure 1. This representation encompasses the entire process, from the initial conception of the ideas to be studied to their full implementation. The area designated for conducting surveys, interviews, and polls has been specifically established at the Salesian Polytechnic University, Centenario Campus. Within these delimitations, the alphabetically named blocks A, B, C, D, and E, as well as the

parking lots, student entrances and exits, and the Salesian School Domingo Comín and its surroundings, are included. This area is highly frequented by students and personnel from the University, facilitating the collection of information for the development of statistical study.

Figure 1

Process systematization



Source: Own elaboration

To determine the need for transportation at the Salesian Polytechnic University Centenario Campus, the population under study consists of 5,011 individuals, including students, faculty, and administrative personnel. The sample size is crucial to the study, as it ensures equal probability for all elements of the population. The formula used to calculate the sample size is detailed in the book *Statistics for Management and Economics* (Levin & Rubin, 2004). By applying the equation for determining sample size in a finite population, the number of people to be surveyed is 357.

According to Porras (2017), the population is selected from a sample of a group or area strata, chosen through a simple random procedure. These groups or subsets, defined as strata, are evaluated homogeneously. The variables were identified through an inquest. An open-ended question was posed: "What factors do you consider important in the context of the Centenario Campus and vice versa?" This question allowed for the establishment of variables corresponding to each of the objectives, as detailed in Table 1. The survey was designed to generate a database to determine the transportation needs of the Guayaquil Centenario Campus. To evaluate the reliability of the survey, Cronbach's alpha coefficient was applied, resulting in a value of 0.7625. This value is considered unfavorable, as a

coefficient greater than 0.8 is expected to ensure greater reliability (Salamanca & Guerrero, 2022).

Table 1

Operationalization of variables

Specific objectives	Dimension	Variables	Indicator	Variable type	Level	Measuring instrument
Study the current demand for transportation modality on the Centenario Campus of the Salesian Polytechnic University.	Transportation demand	Working day	Day attended	Qualitative	Nominal	Survey
		Schedules	Check-in and check-out times	Quantitative	Reason	
		Sector	Passenger pickup and destination location	Qualitative	Nominal	
		Availability	Ease of access to the transportation system	Qualitative	Ordinal	inquest
		Cost	Mobilization expenses	Quantitative	Reason	Survey
		Comfort	Satisfaction when using a transportation system	Qualitative	Ordinal	
		Security	How safe is the transportation system used?	Qualitative	Ordinal	
Evaluate a quality transportation service for members of the academic and administrative community of the Centenario Campus.	Quality transportation service	Punctuality	Compliance with times between routes	Qualitative	Nominal	inquest
		Availability	Ease of access to the transportation system	Qualitative	Ordinal	
		Security	How safe is the transportation system used?	Qualitative	Ordinal	
		Cost	Mobilization expenses	Quantitative	Interval	
		Schedules	Check-in and check-out times	Quantitative	Interval	
Propose an alternative solution for the transportation of the academic and administrative community in a safe and ergonomic way.	Alternative solution for transportation	Security	How safe/reliable is the transportation system used?	Qualitative	Ordinal	Interview with University authorities
		Routes	Distance	Quantitative	Reason	Route optimization software
		Cost	Mobilization expenses	Quantitative	Reason	Interview with University authorities

Source: Own elaboration.

In response to this situation, a statistical analysis of omitted items was conducted using Minitab statistical software. This analysis allowed for the optimization of Cronbach's alpha coefficient by excluding a specific variable. By removing the "accessibility" variable, an increase in Cronbach's alpha was observed, reaching a value of 0.8384. This adjustment was implemented to improve the internal consistency of the survey by excluding a variable that may have negatively impacted the overall reliability of the measurements. To assess the quality of the transportation service, a survey was conducted involving 46 students, 2 teachers, and 2 staff members. Additionally, interviews were held with authorities from the Salesian Polytechnic University to gather insights on the current transportation situation.

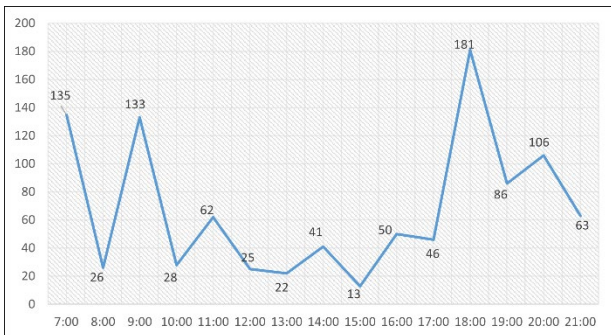
Results and discussion

A random selection of 357 people was conducted to ensure a representative sample of the Salesian Polytechnic University, Guayaquil Campus Centenario. Participants were segmented into strata, including students, faculty, and administrative staff, to capture diverse perspectives on transportation. The survey focused on key aspects such as accessibility, safety, costs, schedules, and comfort, aiming to identify common challenges and needs across the community. This approach provided valuable insights into the effectiveness of current transportation systems and served as a basis for proposing improvements that promote safety, efficiency, and satisfaction within the campus environment.

In the following questions: Do you have any disability that hinders your mobility? the results of the survey of 357 participants, only 1% exhibit a disability, while the remaining 99% do not show this condition. Indicate the type of disability. It shows the presence of 2 person intellectual, 2 physical and 1 hearing disabilities. What activity do you perform at the Centenario campus? The majority of respondents identify themselves as students, comprising 91%, teachers 65% and administrative staff. Indicate the day you mostly attend the University. The Evening-Night mode represents 56%, while the Morning- Evening mode represents 44%. Indicate the admission schedules that you have in all your days at the University. In the admission schedules, a marked tendency is observed in each of the days, with notable peaks at 7:00 and 9:00, as well as at 18:00 and 20:00 see Fig. 2.

Figure 2

Entry time trend

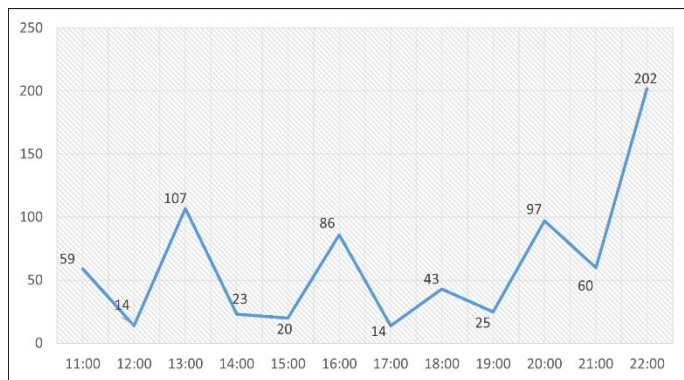


Source: Own elaboration.

In other questions as: Indicate the departure times that you have in all your university hours. In the departure times, a pronounced tendency is evident on each of the days, with notable peaks at 13:00 and 16:00, as well as at 20:00. The most notable peaks are at 13:00 and 16:00, as well as at 20:00 and 22:00 see Fig. 3. What is your point of origin to Centenario campus? The place of origin with the highest percentage corresponds to the route from home to the university, representing 77%. On the other hand, 23% correspond to people who commute from their place of origin to the university. Which sector is closest to your place of origin and subsequent arrival at the University? It is observed that a total of 57 individuals in the sample is currently outside the city. In contrast, the other participants in the sample have been categorized and distributed among the various sectors identified.

Figure 3

Departure time trend



Source: Own elaboration.

For another hand in the questions: What type of transportation do you use to get from your point of origin to the Centenario campus? It shows a considerable rate, where 231 people opt for public transportation to go to the University. What type of transportation do you use to go from the Centenario campus to your home? There is an increase in the use of cabs and other transportation services. However, there is a slight reduction in the use of public transportation when participants travel to their homes. What is the monthly expense for your mobility to the University? Fifty percent of the respondents recorded expenses that exceeded \$30 for their commute to and from the Salesian Polytechnic University.

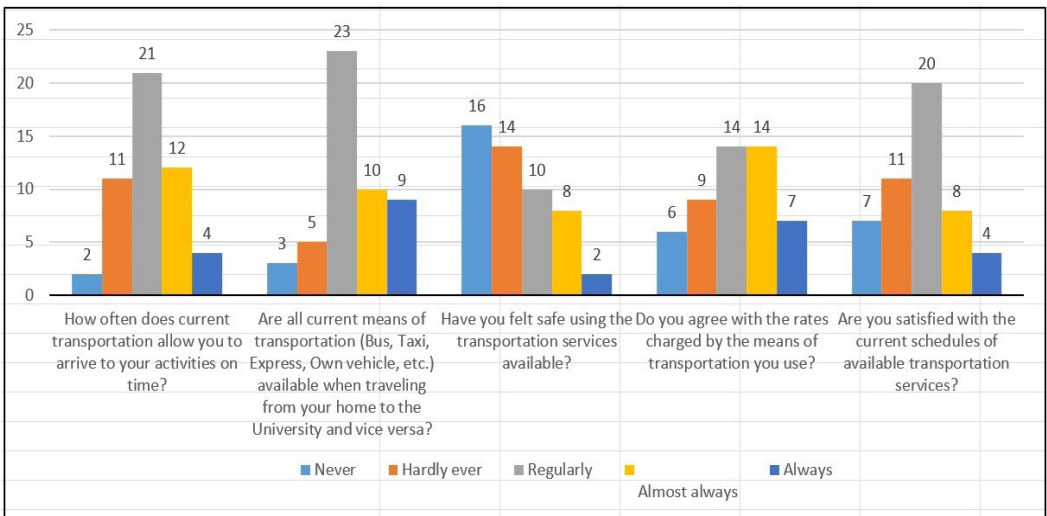
Also, it is question about: According to your perception, rate how safe is the means of transportation with which you currently travel from your place of origin to the Centenario campus and vice versa. It shows that a significant proportion of people, both in the direction of the University and in the reverse direction, experience levels of insecurity. According to your perception, please rate how comfortable is for you the means of transportation with which you currently travel from your origin to the Centenario campus and vice versa. It is evident that a

considerable proportion of people, either going towards or away from the University, experience levels of discomfort.

In Figure 4, a significant proportion of participants indicate that the current transport service makes it easy for them to arrive on time, the service regularly makes it easier for them to arrive on time, as well as to find their means of transportation. When assessing the safety of the transportation used, they report a significant proportion expressing a feeling of insecurity. In addition, the participants are very positive about the fares charged for the various means of transportation. Nevertheless, users suggest that there could be improvements in transportation schedules.

Figure 4

Evaluation of the transportation service



Source: Own elaboration

According to the interviews conducted with the authorities of the headquarters, the participation of various authorities of the Centenario campus was considered with the objective of evaluating the current situation in relation to insecurity and the associated costs during the mobility process. Likewise, we inquired about the measures implemented with the purpose of favoring the community that makes up the Centenario Campus. Authorities to be interviewed: (Vice Rector of the Guayaquil Campus) Considers that the current situation of insecurity is unprecedented since similar situations have not been experienced in the past, this has affected the recurrent activities in instruction, causing 30 to 40 percent of the students to be absent. It indicates that the lighting in parking areas is affected due to people outside the institution, who steal or damage the lighting to strengthen security. He affirms that there are police patrols, however, it is not a constant service. The possibility of establishing a dialogue for the economic benefit of those people who depend on public transportation and are considered the most vulnerable in terms of mobility is emphasized.

He clarifies that it is not possible to implement a transportation system similar to the María Auxiliadora Campus because the infrastructure of the Centenario Campus is not conducive to the operation of large transportation units. (Technical Director of Administration and Inventory - Guayaquil) In order to increase security and maintain control, it was proposed that the units used by external transportation cooperatives be equipped with security cameras. It was noted that the service is free of charge for members of the community and that transportation contracts at the María Auxiliadora Campus are renewed every year. (Academic Development Coordinator - Guayaquil)

It supports the existence of a security cordon to ensure that students do not experience incidents related to crime during their students do not experience crime-related incidents on their way to the public transportation stops in the north and south directions, while simultaneously improving the associated lighting on that route. Reports on ongoing negotiations with external companies that provide transportation services to students of the Domingo Comín school, an entity that is part of the Salesian community. However, it is important to note that this service is paid for by the students themselves. (Director of the Automotive Engineering Career - Guayaquil) Indicates that public transportation is deficient in terms of safety, which restricts their ability to travel. In addition, it highlights the absence of specific programs for sustainable mobility programs on any of the campuses belonging to the Guayaquil campus. (President of the headquarters workers' association)

Considers that it is limiting that the Centenario Campus be open since he mentions that the "we have as neighbors" the company Molinera Nacional and therefore plans for pedestrianization are compromised. To meet the demand for transportation for the community, it is proposed to implement a transportation system that covers the areas mentioned in the survey conducted so that stops are planned through the distribution of sectors, both inside and outside the city. These routes are shows in Table 2.

Table 2*Geographic Areas*

Route 1	
Northwest I	Mucho Lote 1, Bastión Popular, TT Pascuales
Northwest II	Fortín, Entrada de la 8, La florida, Flor de Bastión
Northwest III	Monte Sinai
Route 2	
North Center II	Prosperina, Quinto Guayas, Mapasingue, Juan Montalvo, Urdenor, San Felipe, los Álamos

North I	Kennedy, Urdesa, Garzota, Atarazana, Martha de Roldós
North II	Los Sauces, Guayacanes, Samanes, La Alborada
North III	Vergeles, Autop. Narcisa De Jesús, Orquídeas, Mucho Lote 2
Route 3	
Center	9 de octubre, Ayacucho, Urdaneta, La bahía
Southwest	Isla Trinitaria, Abel Gilbert, Batallón del suburbio, Letamendi, Gómez Rendón, Portete, Cisne, Febres Cordero
South I	Huancavilca, Guangala, La Saiba, Las Américas, Centenario, Base Naval Sur, Los Almendros
South II	Guasmo, Floresta, Los Esteros, Luz del Guayas
Route 4	
North Center I	Ceibos, Bellavista, Av Barcelona
Chongón	Chongón, Villamil Playas, Cerecita, Progreso
West	Via la costa
Route 5	
Durán	TT Durán, Banco Pichincha (Nicolás Lapenti)
Samborondón	Rio Centro Entre Ríos

Source: Own elaboration.

The need has been identified to address the issue of mobility costs for students, evidenced by an average monthly expenditure of \$25. In this context, the possibility of initiating a dialogue with the respective institutional authorities focused on the potential implementation of measures to reduce such costs. Among these measures is the possibility of offering scholarships or subsidies to those who use public transportation. The surveyed people are dissatisfied with the different means of transportation used for their trips. A suggested short-term solution is the formalization of contracts with transportation companies. According to what was indicated in the interviews, it is a requirement that these units must belong to the category of commercial, school, and institutional land transport (Transporte y Obras

Públicas, 2018).

According to Resolution-026-DIR-2022-ANT (Agencia Nacional de Tránsito [ANT], 2022), these units have a useful life of 20 years. However, their use is recommended up to half of their useful life, up to 9 years from their manufacture, as long as their optimal conditions are guaranteed. In case of offering or contracting the service, it is recommended to take as a reference the times of greatest need, being for the entrance at 7:00, 9:00, 18:00, and 20:00; for the departure times at 13:00, 16:00, 20:00, and 22:00.

Suggestions will be considered, such as the installation of surveillance cameras and security cordons in critical areas, such as parking lots or bus stops, in order to ensure the physical and psychosocial integrity of the community. In such a scenario, the transportation unit must comply with the "Minimum Safety Elements in Motor Vehicles" according to the technical regulation (Instituto Ecuatoriano de Normalización [INEN], 2016). In addition, in order to use the transportation, it will be necessary to have a university credential that certifies to the driver or person in charge that the individual belongs to the Centenario Campus. It is recommended that the community's demand for transportation be monitored to ensure that units are available for the proposed routes.

For the present research, tools such as the survey directed to students, teachers and administrative staff of the Salesian Polytechnic University of Guayaquil Centenario campus were carried out. The analysis of the relevant criteria to evaluate the effectiveness, strategies and adaptability of the academic community in the use of transportation revealed significant results. In terms of participants, the majority are identified as students, comprising 91%, while 6% correspond to teachers and 3% to administrative staff. The distribution of academic schedules shows that 56% attend the Evening-Night shift, and 44% attend the Morning-Evening shift.

As for the demand for admission to academic activities, there is a pronounced interest at 7:00 and 9:00, as well as at 18:00 and 20:00. Departure times also show notable patterns, with peaks at 13:00 and 16:00, and at 20:00 and 22:00. The majority of respondents reside in the Tarqui and Ximena parishes of the city of Guayaquil.

However, a group of 57 people were identified who live outside the city, where public and private transportation are the most commonly used means of transportation. In addition, when going out, many people use transportation services such as cabs and express services, which allow them to arrive on time and within their financial reach. A considerable proportion of the surveyed population is satisfied with the fares offered by the different means of transportation. It is important to note that there is a perception of insecurity and discomfort among users when using the different means of transportation. The authorities' testimonies underscore an unprecedented situation of insecurity due to lighting problems and intermittent police patrols.

The existence of a security cordon to prevent criminal incidents at public transportation stops is highlighted. They report on ongoing negotiations with external companies to offer transportation services to students, and highlight the

limitation of the Centenario Campus being open, compromising pedestrianization plans due to its proximity to the Molinera Nacional company. In summary, these testimonies reflect concerns about safety, mobility and infrastructural limitations at the Salesian Polytechnic University in Guayaquil.

This study was based on a sample, i.e., it did not consider 100% of the individuals that make up the Centenario campus. It is suggested that a survey be implemented every six months a survey with the purpose of evaluating the interest of students, faculty, and administrative personnel in the use of a means of transportation provided by the University. In situations where the options presented are not accepted, a space will be provided for the person to textually add their location. This will contribute to the creation of a database that will make it possible to generate new stops in the future, while tracking demand between sectors and stops on the proposed routes.

The results of this research coincide with previous studies on university mobility and its implications. For example, Flores et al. (2022) evaluated spatial accessibility in educational centers in peri-urban areas, highlighting that the lack of adequate transportation directly affects students' equitable access and quality of life. Similarly, Guillamón and Hoyos (2023) analyzed sustainable mobility in universities and pointed out that safety problems, high costs, and inefficient schedules are common in many higher education institutions, reflecting similar findings to those of our study.

In addition, the perception of insecurity identified in this study is consistent with the findings of González Quiñones et al. (2018), who noted that insecurity in public transportation limits users' mobility and affects their psychosocial well-being. However, in this case, a comprehensive approach is proposed that combines safety, accessibility, and sustainability, offering a practical solution adapted to the local context. By integrating the results of these studies with those of this research, the need to address university mobility as an essential component of institutional management becomes evident, reinforcing the importance of implementing efficient transportation systems that contribute to the well-being of the educational community.

Ribeiro and Fonseca (2022) analyzed the commuting patterns of 686 students at the University of Minho, Portugal, emphasizing the potential for sustainable transport. Despite 54% commuting less than 5 km, 42% still drive, though 55% of trips could shift to active transport, reducing motorized transport from 70% to 45% and CO₂ emissions by 27%. These findings highlight the need for sustainable mobility policies, relevant to optimizing university transport in Ecuador. Additionally, implementing Intelligent Transportation Systems (ITS) requires adapting to vehicular flow variations due to class schedules, using sensors and predictive analytics to optimize efficiency and reduce costs (Regragui & Moussa, 2023).

University campuses are key transportation hubs due to the high volume of commuters, impacting traffic congestion, especially during peak hours. Optimizing public transport is crucial for student mobility, and Matas-Monroy, Martín, and Román (2025) found that direct routes, punctuality, and increased bus frequency are essential improvements. Their findings emphasize the need for policies that align with students' mobility needs. Understanding university travel behavior is vital for

promoting sustainability, as distinct commuter patterns shape transportation demand. Hamad, Htun, and Obaid (2021) observed that most travelers at Sharjah University City prefer driving alone, influenced by economic and environmental factors. Gender differences were noted, with female students favoring buses and males opting for active transport. The study underscores the importance of improved public transport, including air-conditioned bus stops, to encourage sustainable travel.

Conclusions

The results derived from the survey have made possible the construction of fundamental data for the initiation of subsequent research that addresses the problems inherent to the processes of mobilization of people at a general level. In the first analysis, the general conclusion has been reached that urban mobility constitutes an aspect of complex dimension, requiring periodic studies and updates, taking as a reference the constant variation of perceptions of population safety and vehicle increase.

This study has reported that the quality of transportation used by people does not reach optimal standards. The criteria of 357 stratifications, segmented among students, faculty and administrative staff, were examined in order to evaluate the needs present, such as accessibility, safety, costs, schedules, and comfort, among others, that impact the daily mobility to the facilities of the Salesian Polytechnic University, specifically the Centenario Campus.

The perspective of the various Campus authorities was considered in order to understand the current situation of mobility within the institution and the measures implemented to obtain positive results in the same. Based on the survey and the poll carried out, considering the measures suggested by the authorities, we proposed the establishment of a transportation system that would benefit the university community, complying with schedules, routes and other essential requirements for the movement of associated individuals. This aims to promote shared transportation and improve the psychosocial well-being of people by using a safe means of mobility.

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Declaration of author responsibility

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Kevin Caiza Medina 2: Conceptualization, Data Curation, Formal Analysis, Research, Methodology, Resources, Software, Supervision, Validation/Verification, Visualization, Writing/original draft and Writing, review and editing.

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