URBAN MOBILITY: A REVIEW OF CHALLENGES AND INNOVATIONS FOR SUSTAINABLE TRANSPORTATION IN BRAZIL

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ABSTRACT

Objective: The aim of this work is to review the literature and analyze trends and innovations in public transportation, as well as discuss the importance and challenges of urban mobility in the Brazilian context.

Theoretical framework: Urban mobility is relevant due to the growth of cities and the need for sustainable transportation. Quality of life and economic development depend on safe and efficient transportation. Mobility also reduces social inequality by allowing access to services and opportunities for different social classes. Inclusive public policies and accessible transportation are crucial to improve people's quality of life.

Method: The methodology adopted in this study was based on a literature review conducted in three distinct phases, covering the planning of the review, the effective execution of it, and the communication and presentation of the results obtained from the research.

Results and conclusion: The review identified that the current scenario of urban mobility in Brazil is marked by a lack of adequate infrastructure for public transportation, cycling, and pedestrian routes, with an increase in the number of private vehicles on the streets and inequality in access to public transportation. To overcome these limitations, integrated planning, investments in quality public transportation, cycling and pedestrian infrastructure, and a cultural change in relation to urban mobility are necessary. Technological innovations, such as vehicle electrification, digitalization of transportation services, and autonomous car systems, are essential to solve the challenges of urban mobility.

Research implications: In the future, integration of transportation forms and intermodal networks is expected to facilitate mobility. Advanced technologies, such as autonomous vehicles, can reduce costs and increase efficiency.

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Investments in infrastructure, such as cycling routes, charging stations, and renewal of public transportation, are necessary. Public policies that encourage the adoption of electric vehicles and shared mobility, such as tax and tariff reductions, can disseminate technologies.

**Originality/value:** It is recommended to analyze the economic and social impacts of the popularization of electric vehicles in Brazil, including financial viability and charging infrastructure. It is important to research advanced technologies, such as autonomous vehicles, to improve the efficiency and safety of public transportation, as well as to examine regulatory and implementation challenges.

**Keywords:** Urban Mobility, Passenger Transportation, Public Transportation, Infrastructure, Sustainability.

**MOBILIDADE URBANA: UMA REVISÃO DOS DESAFIOS E INOVAÇÕES PARA O TRANSPORTE SUSTENTÁVEL NO BRASIL**

**RESUMO**

**Objetivo:** O objetivo deste trabalho é revisar a literatura e analisar as tendências e inovações no transporte público, além de discutir a importância e os desafios da mobilidade urbana no contexto brasileiro.

**Referencial teórico:** A mobilidade urbana é relevante devido ao crescimento das cidades e à necessidade de transporte sustentável. A qualidade de vida e o desenvolvimento econômico dependem de transporte seguro e eficiente. A mobilidade também reduz a desigualdade social ao permitir o acesso a serviços e oportunidades para diferentes classes sociais. Políticas públicas inclusivas e transporte acessível são cruciais para melhorar a qualidade de vida das pessoas.

**Método:** A metodologia adotada neste estudo baseou-se em uma revisão da literatura conduzida em três fases distintas, abrangendo o planejamento da revisão, a execução efetiva da mesma e a comunicação e apresentação dos resultados obtidos pela pesquisa.

**Resultados e conclusão:** A revisão identificou que o cenário atual da mobilidade urbana no Brasil é marcado pela falta de infraestrutura adequada para o transporte público, cicloviárias e pedestres, com aumento no número de veículos particulares nas ruas e desigualdade no acesso ao transporte público. Para superar essas limitações, é necessário um planejamento integrado, investimentos em transporte público de qualidade, infraestrutura cicloviária e de pedestres, e uma mudança cultural em relação à mobilidade urbana. Inovações tecnológicas, como a eletrificação de veículos, digitalização de serviços de transporte e sistemas de carros autônomos, são fundamentais para solucionar os desafios da mobilidade urbana.

**Implicações da pesquisa:** No futuro, espera-se integração de formas de transporte e redes intermodais para facilitar mobilidade. Tecnologias avançadas, como veículos autônomos, podem reduzir custos e aumentar eficiência. Investimentos em infraestrutura, como cicloviárias, estações de carregamento e renovação do transporte público, são necessários. Políticas públicas que incentivem a adoção de veículos elétricos e mobilidade compartilhada, como reduções de impostos e tarifas, podem disseminar tecnologias.

**Originalidade/valor:** Recomenda-se analisar os impactos econômicos e sociais da popularização de veículos elétricos no Brasil, incluindo viabilidade financeira e infraestrutura de carregamento. É importante pesquisar tecnologias avançadas, como veículos autônomos, para melhorar a eficiência e segurança do transporte público, além de examinar os desafios regulatórios e de implementação.

**Palavras-chave:** Mobilidade Urbana, Transporte de Passageiros, Transporte Público, Infraestrutura, Sustentabilidade.

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1 INTRODUCTION

The issue of urban mobility has gained significant attention worldwide, and it is anticipated that it will continue to grow in relevance in the future. This is because urban mobility plays a vital role in ensuring the well-being of city dwellers (Rocha, 2021). It is directly linked to accessibility, safety, and comfort in transportation, which are crucial factors that affect the overall quality of life of urban residents (Wey & Huang, 2018). Investing in a robust public transportation infrastructure, implementing bike lanes, and ensuring well-maintained sidewalks, as well as proper traffic route planning, are crucial measures to reduce traffic congestion and shorten commute times. By doing so, cities can effectively address issues related to stress, air pollution, and noise pollution caused by prolonged travel time and traffic jams (Devarajan et al., 2020). Investing in urban mobility infrastructure not only addresses traffic congestion and pollution but also has a positive impact on individuals' health and the local economy (Soliani, 2021). By encouraging physical activity and facilitating the movement of people and goods, it can create a healthier and more prosperous city (Nikitas et al., 2021).

As cities continue to grow and populations increase, there is an urgent need to reduce the environmental impact of transportation. In response, public transportation trends and innovations are constantly evolving to meet the challenge (Pojani & Stead, 2015). The demand for sustainable and efficient transportation solutions has led to the development of new technologies and mobility services, such as electric buses, shared bikes and scooters, and ride-sharing platforms. These solutions not only reduce carbon emissions and air pollution but also offer affordable and convenient options for commuters (Reck et al., 2022).

Technological advancements are revolutionizing urban mobility by utilizing apps and digital platforms for various purposes such as route planning, ticket purchasing, and ride-sharing. These innovations have made transportation more accessible and convenient for commuters, improving their overall travel experience (Willing et al., 2017). Along with the above-mentioned advancements, there are other innovations that are emerging in the field of urban mobility. For instance, there is a growing trend of using clean and renewable energies, such as solar power and electric vehicle charging, to power transportation. This not only helps reduce carbon emissions but also reduces the dependence on fossil fuels (Holmberg & Erdemir, 2019). The ongoing trends and innovations in urban mobility have the potential to make it more sustainable, safe, and accessible for all.

The lack of planning and investment in infrastructure, as well as the insufficient integration among different transportation modes, inadequate service provision, and limited resources for improving urban mobility, are among the main challenges that affect urban mobility in Brazil (Bezerra et al., 2020). These issues directly impact people's quality of life, resulting in lengthy commutes, a lack of safety, and high transportation costs within the cities (Nieuwenhuijsen, 2020).

Urban mobility presents a crucial challenge that demands urgent attention: reducing the emission of polluting gases and promoting sustainability. To achieve this, we must prioritize the adoption of electric vehicles, expand shared mobility services, and implement public policies that encourage the use of alternative transportation, such as bicycles and electric scooters (Kubik, 2022). Ensuring social inclusion in urban mobility poses a major obstacle in Brazil. Insufficient access to dependable public transportation is a significant hurdle for a large population, especially those residing in the outskirts of cities, where commuting becomes arduous (Barbosa, 2015). It is essential to adopt public policies that promote social inclusion and improve people's quality of life, ensuring safe, accessible, and efficient transportation.

Guzman et al. (2017) argue that efficient and secure mobility is vital for improving the quality of life of individuals and fostering economic development in cities. Moreover, it directly
contributes to reducing social inequality by providing people from different social backgrounds equal access to services and opportunities.

Efficient and safe urban mobility can offer multiple advantages to Brazilian society, including decreased commute time, better air quality, less traffic congestion, and increased social inclusion (Fontoura et al., 2019). Additionally, transportation plays a crucial role in the country's economic development, facilitating the flow of goods and services and creating job opportunities (Soliani, 2022a). Consequently, it is imperative to establish public policies that incentivize the enhancement of urban mobility and transportation in Brazil.

The challenges of urban mobility and public transportation in Brazil are complex and multifaceted, involving issues such as lack of investments, poor integration among different transportation modes, low-quality services, and social exclusion. These problems have negative impacts on people's lives, such as long commuting times, air pollution, traffic congestion, and increased costs of transportation. Therefore, it is necessary to find solutions that can address these challenges and improve urban mobility in an integrated and sustainable manner.

This study aims to conduct a literature review that explores trends and innovations in public transportation while also discussing the challenges and importance of urban mobility in Brazil. By analyzing trends and innovations in public transportation, the study aims to identify solutions that can improve the efficiency, safety, and sustainability of transportation in Brazilian cities. Additionally, the study intends to raise awareness among decision-makers and society about the need for investing in infrastructure, public policies, and technological solutions to improve citizens' quality of life and drive the country's economic development.

2 METHODOLOGY

To investigate the theme of urban mobility and public transportation in Brazil, conducting a literature review is essential as it provides the researcher with access to a vast range of information and knowledge previously published on the subject (Bibri & Krogstie, 2017). Through the literature review, it is possible to identify gaps in existing knowledge and the most recent advances in the field, which are fundamental for a solid and updated research. Moreover, it helps to ensure that the study is based on reliable and validated sources, providing greater credibility to the work (Behrends, 2016).

The methodology used in this study was based on that employed by Oliveira et al. (2017), which recommends conducting a literature review in three distinct phases. The first phase involves planning the review, while the second phase entails the actual conduct of the review. Lastly, the third phase refers to the communication and presentation of the results obtained from the research. The review procedure used is illustrated in Figure 1.

![Figure 1](image)

**Figure 1:** Literature review procedure used

**Source:** Adapted from Oliveira et al. (2017).

The planning phase involves identifying the need for the review, developing the review proposal, and creating the review protocol. The conduct phase is divided into four stages:
identification, selection, and inclusion of articles; evaluation of the selected works; extraction of data and information; and synthesis of data. Finally, the presentation phase includes preparing reports and presenting the results.

In order to increase the variety of identified articles, more than two databases were utilized during the identification stage of the review protocol, including Web of Science, Scopus, and Scielo. A combination of keywords - "Urban Mobility" AND "Sustainability" OR "Public Transportation" AND “Sustainable” - was selected to identify research proposing different approaches to the topic.

We conducted a systematic search of national and international peer-reviewed journals published between 2015 and 2022, using keywords related to urban mobility. We focused on titles, abstracts, and keywords to ensure that our analysis included only current publications that reflect the ongoing evolution of technologies in this field. To ensure that we selected only the most relevant articles, we used content analysis to apply inclusion and exclusion criteria. Specifically, we excluded works that discussed urban mobility and public transportation but did not propose any recommendations for improving efficiency, safety, or sustainability. By applying these rigorous criteria, we aimed to provide a comprehensive review of the most current and relevant literature on this topic.

Initially, 157 articles were identified, but after removing duplicates, we were left with a list of 137 articles. We then read the abstracts of these articles and excluded 71 that were not relevant to our discussion. We recorded the relevant information in a database to facilitate the classification, investigation, and evaluation of the studies used in our research. After conducting a thorough reading of the remaining 66 articles, we excluded an additional 11 according to our established criteria, resulting in a total of 55 studies that were included in the literature review.

Finally, the literature review identified several emerging themes in the field of urban mobility and public transportation in Brazil, which will be discussed in the following section. These findings have important implications for future research and public policy, as they can inform targeted investments and interventions in areas where attention and resources are most needed.

3 RESULTS AND DISCUSSION

3.1 The Current Scenario of Urban Mobility in Brazil

The review of literature reveals that the present state of urban mobility in Brazil is characterized by significant challenges. These include insufficient infrastructure to support public transportation, bicycle lanes, and pedestrian walkways, and an alarming rise in the number of private vehicles on the streets (Tucker & Manaugh, 2018). Despite some cities' efforts to improve mobility by implementing solutions such as exclusive bus lanes and sustainable transportation modes like bicycles and electric scooters, many still struggle to provide affordable and high-quality transportation to their populations. Moreover, the COVID-19 pandemic has introduced new challenges, such as the need to adapt public transportation to comply with social distancing measures and accommodate changes in commuting habits (Gkiotsalitis & Cats, 2021).

The challenges faced by public transportation in Brazil have a direct impact on urban mobility. According to Amann et al.'s (2016) study, insufficient investment in infrastructure is one of the main factors that contribute to the inefficiency and unattractiveness of public transportation to the population. Inadequate infrastructure, such as a shortage of exclusive bus lanes and overcrowded vehicles, is a widespread problem in many Brazilian cities. Moreover, the lack of accessibility poses a significant challenge for people with disabilities or limited mobility, who often cannot use public transportation adequately (Lima & Machado, 2019).
These issues make public transportation unappealing, leading many people to choose private vehicles and exacerbating traffic congestion and air pollution (Le & Trinh, 2016).

The study conducted by Slovic et al. (2019) highlights the significant challenge of unequal access to public transportation. The inadequate coverage of bus and subway lines in peripheral areas of many cities makes commuting difficult for the poorer population. This, in turn, has a direct impact on the quality of life and productivity of workers who are forced to endure long hours of travel to reach their workplaces. For instance, in São Paulo, work-related trips take twice the distance and significantly longer when compared to other types of trips. Moreover, there is a 25% increase in the use of motorized forms of transportation (Chiquetto et al., 2022).

Promoting the use of sustainable modes of transportation like bicycles and electric scooters is crucial for improving urban mobility. However, the lack of incentives to encourage their usage remains a major challenge. Although some cities have invested in cycling infrastructure, many users still encounter obstacles like inadequate safety measures and poor connectivity between bike lanes (Iwińska et al., 2018). Furthermore, the lack of a sustainable mobility culture hampers the adoption of these modes of transportation (Bakogiannis et al., 2019). Therefore, it is essential to create a conducive environment that incentivizes sustainable transportation and encourages the development of a culture that promotes it.

The current model of urban mobility in the country has several limitations that affect the population's quality of life. The dependence on private cars as a means of transportation is one of the main problems, as it generates traffic congestion, air and noise pollution, and traffic accidents (Sá et al., 2017). Furthermore, the lack of investment in high-quality public transportation, coupled with a culture of undervaluing public transportation, makes it difficult to adopt more sustainable and accessible alternatives for the population (Bezerra et al., 2020).

To overcome these limitations and improve urban mobility, it is crucial to have integrated and efficient planning among municipal, state, and federal governments. This will ensure investments in high-quality public transportation and the development of safe and accessible cycling and pedestrian infrastructure (Silva et al., 2015; Martinez Delgado et al., 2022). However, it is not only up to the government to make changes; there also needs to be a cultural shift among the population regarding urban mobility. People need to become aware of the benefits of using sustainable modes of transportation and the importance of valuing public spaces for people's circulation, rather than solely for private vehicles (Freudendal-Pedersen & Kesselring, 2021).

3.2 Trends and Innovations in Urban Mobility

The concept of trends and innovations in urban mobility refers to the transformations and changes in the transportation sector driven by new technologies, habits, and societal demands (Miskolczi et al., 2021). Trends refer to patterns of behavior and user preferences, while innovations encompass technological solutions that offer new possibilities for mobility, including electric vehicles, ride-sharing apps, and autonomous car systems (Paiva et al., 2021). These trends and innovations are crucial for developing more efficient, accessible, and sustainable urban transportation solutions that can address the demands and challenges of modern mobility.

Technology is transforming urban mobility worldwide, with new trends emerging every day. One of the main trends is the electrification of vehicles, which is gaining more and more space in the market (Muratori et al., 2021). Electric cars, buses, and bicycles are more sustainable and accessible alternatives for the population, reducing pollution and transportation costs. These means of transportation help significantly reduce the emission of pollutants and air pollution, making cities cleaner and healthier (Requia et al., 2018). Additionally, the
operating and maintenance costs of these vehicles are lower compared to conventional vehicles, which can lead to significant savings for users (Soliani, 2022b). Finally, the use of electric vehicles also contributes to the reduction of dependence on fossil fuels, which is important for reducing greenhouse gas emissions and mitigating climate change (Weiss et al., 2015).

The digitization of transportation services is another major trend in urban mobility, with the rise of popular ride-sharing apps such as Uber, 99, and Cabify. These apps offer greater flexibility and personalized mobility solutions, allowing users to choose the transportation mode that best suits their needs (Li & Voege, 2017). Additionally, digitization can lead to improvements in traffic management and congestion reduction, utilizing technologies such as sensors, intelligent algorithms, and real-time communication systems. By utilizing these tools, it's possible to monitor the flow of vehicles in real-time, identify congested areas, and create alternative routes to avoid heavy traffic (Nellore & Hancke, 2016). Moreover, digitization can aid in coordinating the use of public and shared transportation, promoting more efficient and sustainable use of urban roads (Noussan & Tagliapietra, 2020). With intelligent traffic management, it's possible to enhance urban mobility, reduce travel time, and minimize the emission of polluting gases.

The use of autonomous cars is a growing trend that is transforming urban mobility by enabling a more efficient and sustainable traffic. Advanced artificial intelligence and sensor technologies allow autonomous cars to detect objects, pedestrians, and other vehicles in real-time, reducing the risk of accidents and increasing safety on the streets (Khayyam et al., 2020). In addition, autonomous cars can communicate with each other, leading to smoother traffic flow and reduced congestion. As the adoption of autonomous cars increases, it is possible to promote more efficient and sustainable mobility, decreasing travel time and pollution emissions while also enabling the inclusion of people who cannot drive or have mobility difficulties (Golbabaei et al., 2021). Nevertheless, this trend also presents challenges such as safety and ethical issues that still need to be addressed (Daily et al., 2017).

In Brazil, some innovations in the field of urban mobility and public transportation have been implemented, such as BRT (Bus Rapid Transit) systems, which offer faster and more efficient trips. The BRT operates based on a specific infrastructure, which includes exclusive lanes and preferential corridors, boarding and disembarking stations with pre-paid fares, articulated and/or bi-articulated vehicles with high passenger capacity, and technologies that allow for greater agility in public transportation, such as traffic signal prioritization, passenger information systems, among others (Jansson et al., 2016). This infrastructure allows buses to circulate quickly and efficiently, without being affected by congested traffic, making the BRT system faster and more efficient than conventional public transportation. In addition, the adoption of quality standards in terms of comfort, safety, and punctuality of the services offered is also part of the BRT bus system (Tomaz de Aquino et al., 2018).

An increasingly popular trend is the integration of multiple transportation modes into a single platform, enabling users to select the best mobility option based on their preferences and needs. This integration is achieved by providing comprehensive information on different transportation modes available in a specific urban area, such as subways, buses, taxis, and shared bicycles (Shaheen & Chan, 2016). This information can be accessed through a mobile application or information system at public transportation stations. Users can then decide on the best mobility option considering factors such as travel time, cost, comfort, and convenience. The objective of multimodal integration is to improve transportation efficiency, reduce costs for users, and promote sustainable urban mobility (Hensher, 2017).

However, it is important to emphasize that all these innovations and trends must be thought and implemented in a sustainable way, taking into consideration the socio-environmental impacts and accessibility for the entire population. In addition, it is necessary to
invest in infrastructure and public policies that encourage the adoption of more sustainable and accessible urban transportation solutions.

3.3 Outlook for the Future of Urban Mobility in Brazil

In the coming years, significant changes in urban mobility and public transportation are expected to occur in Brazil. With the growing concern for sustainability and the search for more efficient and cost-effective solutions, various transportation technologies and models are being implemented in the country (Dranka & Ferreira, 2020). Some of the main projections include the popularization of electric vehicles, the growth of shared mobility, the strengthening of public transportation, and the advancement of technology in traffic management (Machado et al., 2018).

The growing demand for electric cars has been mainly driven by two main reasons: environmental concerns and improvements in battery technology. Environmental concerns related to climate change and air pollution are driving a greater demand for electric vehicles, which produce significantly lower emissions than fossil fuel-powered vehicles (Zhao et al., 2021). In addition, many countries and regions are adopting ambitious greenhouse gas emission reduction targets and encouraging the transition to electric vehicles. At the same time, battery technology has significantly improved in recent decades, allowing electric vehicles to have greater range, shorter charging times, and better performance compared to previous models (Deng et al., 2020).

This trend of growth in demand for electric cars may lead to significant changes in the business model of automotive companies and charging infrastructure. Automotive companies will need to change their production strategy and invest more in electric vehicles to meet the growing demand and remain competitive in the market (Llopis-Albert et al., 2021). Additionally, the charging infrastructure will need to be expanded to meet the needs of electric car owners, with more charging stations in public and private locations (Das et al., 2020).

Shared mobility is projected to play a major role in the future of urban mobility in Brazil. Models such as shared cars, electric bicycles, and scooters are gaining popularity in the country's major cities. By renting these vehicles for short periods, people can save money, reduce traffic on the streets, and contribute to the reduction of pollutant gas emissions (Procopiuck et al., 2021).

In addition, it is expected that public transportation will be strengthened in the coming years. With increasing urbanization and population growth in major cities, it is necessary to offer more efficient and economical solutions for public transport (Wei et al., 2016). Investments are expected to be made in infrastructure and technology to improve the quality of public transportation, as well as incentives to encourage the use of these modes of transport, such as reduced fares and expanded network of lines.

It is also expected that significant advances will occur in traffic control technology. With the use of intelligent monitoring and control systems, it is possible to reduce congestion on the streets, improve traffic flow, and increase user safety (Zadobrischi et al., 2020). These solutions may include the implementation of smart traffic lights, the use of sensors to monitor traffic, and the utilization of algorithms to optimize the flow of vehicles (Nellore & Hancke, 2016).

Although the projections for urban mobility in Brazil are positive, there are some limitations that can affect the implementation of these changes. One of the main challenges is the lack of investment in infrastructure (Amann et al., 2016). For new technologies and transportation models to be effective, significant investment in infrastructure is necessary, such as new bikes and electric scooter lanes, electric vehicle charging stations, and renovation of public transportation systems (Velandia Vargas et al., 2020).
The dissemination of these technologies and transportation models may face resistance from interest groups such as public transportation companies or taxi drivers. These groups may oppose these changes and try to prevent their implementation, which can hinder the dissemination of these solutions throughout the country (Tzur, 2019). The lack of public awareness about the importance of sustainable urban mobility can also limit the success of these changes. It is important to educate the population about the benefits of these technologies and transportation models and encourage them to adopt them in their daily lives (Pojani & Stead, 2015).

While the outlook for urban mobility and public transportation in Brazil appears promising, several challenges must be overcome to successfully implement these changes. These challenges include the need for substantial investment in infrastructure, increased public awareness regarding sustainable transportation options, and the necessity of overcoming opposition from interest groups. Only by addressing these factors can Brazil achieve sustainable and efficient urban mobility.

4 CONCLUSION

Urban mobility and public transportation in Brazil are experiencing several trends and innovations, including the popularization of electric vehicles, the growth of shared mobility, the strengthening of public transportation, and the advancement of technology in traffic management. These changes aim to improve people's quality of life and reduce the environmental impacts caused by transportation.

The popularity of electric vehicles is a major trend in urban mobility in Brazil, as these vehicles are cleaner and more efficient than those powered by fossil fuels. Shared mobility, which includes shared bikes, scooters, and cars, has become an increasingly popular alternative in large Brazilian cities.

For the future, it is expected that there will be greater integration between different forms of transportation, including the creation of intermodal networks that facilitate user mobility. In addition, the adoption of more advanced technologies, such as autonomous vehicles, can completely transform the transportation sector in the country, reducing costs and increasing the efficiency of transportation systems.

For these changes to be successfully implemented, significant investments in infrastructure are necessary, such as the construction of new bike lanes, electric vehicle charging stations, and the renovation of public transportation systems. In addition, public policies that encourage the adoption of electric vehicles and shared mobility, such as tax and fare reductions, can contribute to the dissemination of these technologies.

Finally, it is important to emphasize the need for education and awareness of the population about the importance of sustainable and efficient urban mobility. Campaigns and incentives to adopt these technologies can contribute to transforming urban mobility in Brazil in a positive and effective way.

For future studies, it is recommended to analyze the economic and social impacts of the popularization of electric vehicles in Brazil, including the financial feasibility and the need for investment in charging infrastructure. In addition, given the trend of technological innovation in the sector, it is important to conduct further research on the use of advanced technologies, such as autonomous vehicles, to improve the efficiency and safety of public transportation. It is also necessary to examine the regulatory and implementation challenges that these solutions may present.
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