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Pedaling for the future: The integration of the bicycle into the road network of Tangará da Serra - MT, as a strategy for reducing CO_2 emissions.

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Pedalando para o futuro: A Integração da Bicicleta na malha viária de Tangará da Serra–MT, como estratégia na redução das emissões de CO_2

RESUMO

Objetivo – Apresentar um estudo de viabilidade e propor a aplicação de tratamento cicloviário para algumas vias no município de Tangará da Serra - MT

Metodologia - Utilizou-se referências bibliográficas, levantamento de campo e pesquisa qualitativa.

Originalidade/relevância - Há muitos estudos sobre mobilidade urbana em grandes cidades, mas poucos voltados a cidades novas e de médio porte. Nesse sentido a temática contribui com o debate sobre mobilidade urbana sustentável

Resultados – Pode-se perceber a baixa concentração de infraestrutura ciclável, porém há possibilidade de uma redistribuição de espaços que possibilitaria a inserção da infraestrutura para bicicletas na malha urbana.

Contribuições teóricas/metodológicas – Demonstração por meio de imagens e levantamentos que a cidade pode prover infraestrutura ciclável com intervenções mínimas.

Contribuições sociais e ambientais – Os achados destacam a importância de garantir acessibilidade e mobilidade urbana, propondo um modo de deslocamento sem impactos ao meio ambiente.

PALAVRAS-CHAVE: Mobilidade. Infraestrutura. Bicicleta.

Cycling into the future: Integrating bicycles into the road network of Tangará da Serra–MT, a strategy for reducing CO_2 emissions

ABSTRACT

Objective – Present a feasibility study and propose the application of cycle path treatment for some roads in the municipality of Tangará da Serra - MT

Methodology – Bibliographical references, field survey and qualitative research were used.

Originality/Relevance – There are many studies on urban mobility in large cities, but few focused on new and medium-sized cities. In this sense, the theme contributes to the debate on sustainable urban mobility.

Results – The low concentration of cycling infrastructure can be seen, but there is the possibility of a redistribution of spaces that would allow the insertion of bicycle infrastructure into the urban network.

Theoretical/Methodological Contributions – Demonstration through images and surveys that the city can provide cycling infrastructure with minimal interventions.

Social and Environmental Contributions – The findings highlight the importance of ensuring accessibility and urban mobility, proposing a mode of travel without impacting the environment

KEYWORDS: Mobility. Infrastructure. Bicycle

Ciclismo hacia el futuro: Integración de bicicletas en la red vial de Tangará da Serra–MT, una estrategia para reducir las emisiones de CO_2

RESUMEN

Objetivo – Presentar un estudio de viabilidad y proponer la aplicación del tratamiento de ciclovías para algunas vías del municipio de Tangará da Serra - MT

Metodología – Se utilizaron referencias bibliográficas, investigación de campo e investigación cualitativa.

Originalidad/Relevancia – Hay muchos estudios sobre la movilidad urbana en las grandes ciudades, pero pocos se centran en las ciudades nuevas y medianas. En este sentido, la temática contribuye al debate sobre la movilidad urbana sostenible.

Resultados – Se observa la baja concentración de infraestructura ciclista, pero existe la posibilidad de una redistribución de espacios que permita la inserción de infraestructura ciclista en la red urbana.

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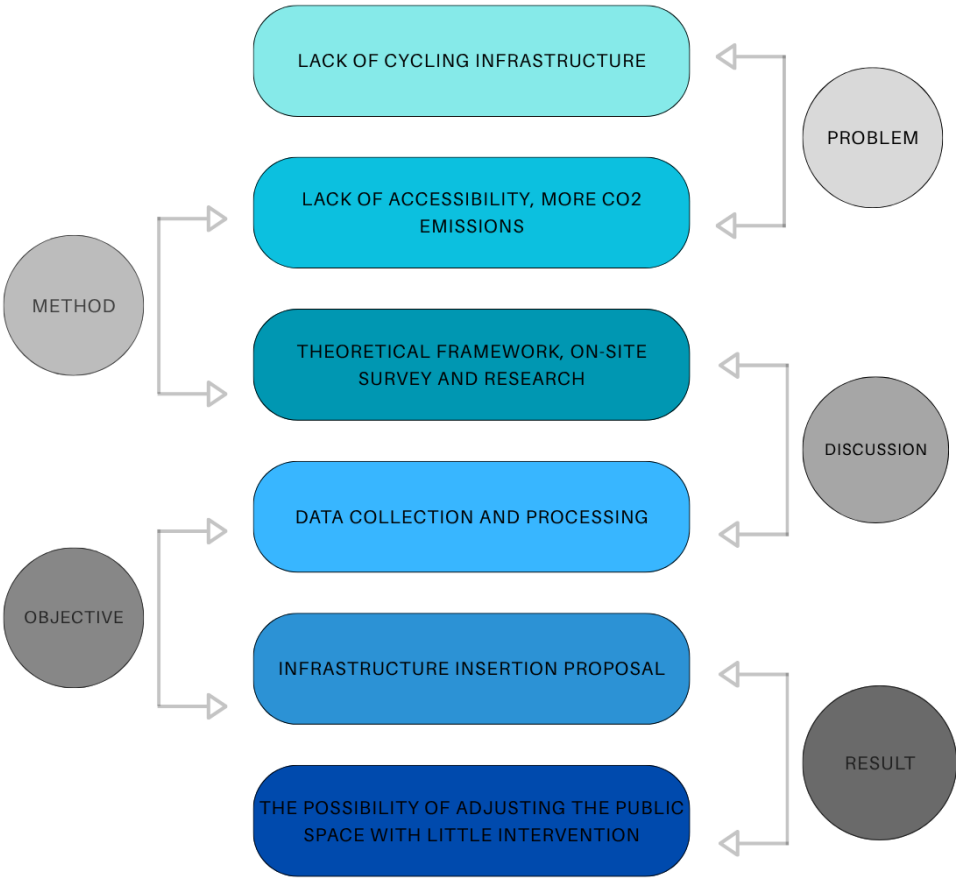
Contribuciones Teóricas/Metodológicas – Demostración mediante imágenes y encuestas de que la ciudad puede dotar de infraestructura ciclista con mínimas intervenciones.
Contribuciones Sociales y Ambientales – Los hallazgos resaltan la importancia de asegurar la accesibilidad y la movilidad urbana, proponiendo un modo de viaje sin impactar el medio ambiente.

PALABRAS CLAVE: Movilidad. Infraestructura. Bicicleta.

RESUMO GRÁFICO



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1 INTRODUCTION

The prioritization of motorized mobility and the lack of accessibility and infrastructure for those who travel by active modes are increasingly affecting the routine and daily lives of commuters (Heinrichs and Jarass, 2020). Consequently, several problems caused by this prioritization can be highlighted, such as congestion, higher accident rates, damage to the natural environment, socio-spatial segregation, greater loss of time when commuting, greater CO2 emissions, among other factors (Batista and Lima, 2020). Lopes and Rossetto (2020) highlight the competition for space between motorized vehicles and passers-by, which ends up discouraging active commuting, increasing the problems related to mobility. In this scenario, it is necessary to remember when this process of consolidating motorized modes began.

This process began after the Second World War, with the establishment of the first automobile industries in Brazil. In this context, some of the actions of the Federal Government at the time stand out, such as the adoption of the highway model of urbanism and the extension of the road network as decisive factors that drove and influenced the choice of the predominant mode for urban commuting (Vasconcellos, 2014). Due to the consolidation of motorized vehicles as a result of the introduction of the automobile industry, the automobile began to have a major influence on the structure of the urban road network. As a result, the roadbed began to expand to provide greater fluidity for these machines, through the construction of highways and avenues (Lopes; Martorelli; Vieira, 2021).

With the possibility of covering medium and long distances in short periods of time, the advent of motorized mobility has also contributed significantly to the generation and expansion of urban peripheries, requiring people living in these areas to travel further to access essential urban facilities such as schools, hospitals, workplaces, among others (Neri e Silva, 2023). At the heart of this problem are factors such as socio-spatial segregation, the result of an urbanization process marked by speed and inequality, the lack of effective urban planning policies and scarce public investment in mobility infrastructure (Marino, 2024). Second Maricato (1996), motorized transport, combined with illegal allotments, was one of the main factors driving territorial expansion and socio-spatial segregation in the 1950s, 1960s and 1970s.

As a result, many Brazilian cities are facing the negative impacts of the lack of proper urban planning, especially with regard to mobility. These impacts are manifested, above all, in the absence of infrastructure for alternative modes, which could significantly contribute to alleviating and mitigating the problems related to the excess of motorized vehicles.

On a local scale, in the city of Tangará da Serra - MT, these difficulties are becoming evident, due to the prioritization of motorized mobility over more sustainable forms of travel. In this sense, according to Lopes and Santos Neto (2024), the implementation of a cycling system not only proves to be effective in mitigating congestion, but also contributes to encouraging active mobility and consolidating the bicycle as a means of everyday transportation, especially in areas where cars and motorcycles predominate.

Starting from this premise of providing accessibility and urban mobility for cyclists, it is important to highlight the benefits that the inclusion of cycling infrastructure provides for

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society. These include greater fluidity in traffic, encouragement of physical activity, integration with other modes, less impact on the natural environment and more. In terms of the environmental aspect, small and medium-sized cities with a high concentration of motorized vehicles are more likely to develop respiratory diseases such as bronchitis and asthma. On a global scale, polluting gases also drive climate change (Florindo et al. 2025). In this way, the inclusion of the bicycle goes beyond the field of mobility and positively influences other areas, demonstrating its importance and urgent viability.

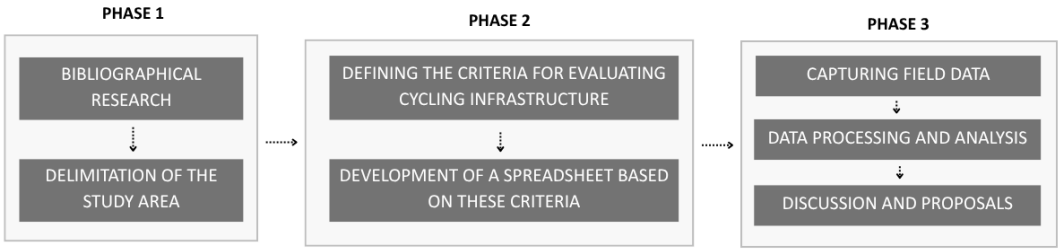
In view of the above, the aim of this paper is to present a feasibility study into the application of cycling treatment to some roads in the municipality of Tangará da Serra - MT, setting out the mechanisms adopted, as well as the infrastructure and cycling network proposed for the city targeted by this study. The textual structure is divided into three topics, in addition to the introduction and final considerations. In the first topic, the methodology will be explained, some terms will be defined and then an urban mobility survey will be shown, which was designed to collect public opinion on active locomotion. Finally, a project proposal and the infrastructure adopted will be highlighted, through graphic illustrations showing the readjustment of the spaces.

2 METHODOLOGY

The methodology employed consisted of three phases. Bibliographical research marks the first phase and was carried out with the aim of building a theoretical basis for the study, involving books, standards and subjects related to urban mobility. In the second phase, the criteria for evaluating the existing cycling infrastructure were defined. This stage involved an on-site survey, aimed at analyzing the level of structure of the road, and then, based on this reported data, developing a spreadsheet and classifying each point analyzed.

Finally, in the last stage, data extracted from a digital survey is presented, detailing the universe of those surveyed and the classification of those involved, pointing out the level of satisfaction of users in relation to the routes used to commute daily, and a solution for these analyzed roads, exposing the current situation and an effective proposal. (Figure 1)

Figure 1 – Study phases



Source: Authors, 2025

This work is characterized as qualitative research, based on the verification of the cycling infrastructure carried out by means of an on-site survey, which made it possible to observe the physical and structural conditions of the environment, complemented by a public opinion

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survey, used to capture the perception and demands of users regarding mobility, traffic safety and other issues related to the topic. In addition, the analysis of photographic images helped to identify critical points and to understand the current use of urban spaces.

To support the research, issues related to Urban Mobility were considered, addressing topics linked to different modes of transport, especially cycling infrastructure, focusing on the conditions and resources needed to ensure the safety and functionality of bicycle lanes. These concepts guided the evaluation and served as a basis for reconfiguring the commuting space.

3 URBAN MOBILITY

Urban mobility is defined by Law 12.587/2012, which deals with the National Urban Mobility Plan (PNMU), as the condition in which people and freight move around the urban space. In other words, it is a condition that seeks to facilitate and simplify movement. In this context, in order for this movement to take place, it is necessary to implement essential infrastructure, such as streets, sidewalks, cycle paths, cycle lanes, among others.

For Kneib (2016), this definition can be understood as a set of factors that allow users to move around in the urban environment, enhancing access to regions and consequently democratizing the use of space. In this way, the term Urban Mobility is associated with pedestrian traffic and active or motorized vehicles, where individual driving is defined through motorcycles, bicycles and cars and collective driving through buses, subways, streetcars and more.

On the subject of modes, it is important to note that before the consolidation of motorized modes, travel was carried out by animal traction or through active mobility, such as walking or cycling, where the fuel for these means is through human propulsion. Later, in 1920, Brazil began to adopt the first fleets of motorized vehicles to enable public transport in the city of São Paulo, but at that time the mode was not yet the most widely used. It wasn't until after the Second World War, around 1956, when the first automobile industries were set up, that the main means of transport for Brazilians became motorized public transport via buses (Vasconcellos, 2014).

According to the National Public Transport Agency (2021), the uptake of motorized modes is growing more and more. In 1990, the ratio of inhabitants to vehicles was 9 people to 1 motorized vehicle. By 2020, this ratio had risen to 9 people to 2 vehicles, evidencing the aforementioned growth. In this context of the consolidation of one mode of transport and the lack of infrastructure for active mobility, there is an imbalance in the balance of urban mobility. As a result of this reality, mobility presents various problems for society, such as congestion points, higher accident rates, socio-spatial segregation and other various adversities (Maropo et al., 2019). According to Gehl (p. 13, 2013), “Mobility is an essential component of city health.” Cities cannot be designed for cars". Thus, the mobility plan emerges as a public policy established alongside the PNMU, as an instrument to guarantee the right to mobility, seeking to organize active and motorized travel (Brasil, 2012).

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In addition, the United Nations Conference held in 2015, with the participation of more than 190 countries, including Brazil, also lists the Sustainable Development Goals (SDGs). In this sense, the National SDG Commission - CNODS, recognizing the importance of this process, included in its 2017-2019 Action Plan the responsibility of adapting the global goals to the Brazilian reality. Among the goals, SDGs 3, 10, 11 and 13 present guidelines that relate directly to urban mobility, through attributions aimed at promoting health, reducing inequalities, sustainable urban development and combating climate change (IPEA, 2018).

- SDGs 3 – Ensuring a healthy life and promoting well-being for all, at all ages
- SDGs 10 – Reducing inequality within and between countries
- SDGs 11 – Making cities and human settlements inclusive, safe, resilient and sustainable
- SDGs 13 – Take urgent action to combat climate change and its impacts

In view of the above, it can be said that the adoption of the bicycle, made possible through the implementation of an adequate cycling infrastructure, is a plausible alternative for promoting sustainable urban development. This measure contributes to reducing traffic accidents, reducing socio-spatial segregation and, consequently, mitigating various problems that affect society in general. In this context, it is essential to understand the role of cycling infrastructure, not just as a physical element in the urban space, but as part of an integrated mobility policy that favors the use of active modes.

3.1 Cycling Infrastructure

In order to create an accessible urban environment with adequate mobility, it is essential to implement components that make it possible for bicycles to circulate. In this sense, cycling infrastructure can be defined as a set of mechanisms that make it possible for cyclists to move from one point to another, such as: signposted surfaces designated for the flow of bicycles, in a shared and/or exclusive way, separated or in networks, constituting support points, stopping points, parking, tree planting and more. Its application offers users a series of benefits, such as safety, agility, thermal comfort, accessibility and mobility (Contran, 2022).

Among the mechanisms adopted, the Institute for Transport and Development Policy (2017) outlines two types of networks that can be applied in this cycling system: the structuring network and the feeder network. The first has the function of tracing the direct routes of longer journeys, interconnecting with some distinct regions of the urban environment by means of circulation axes. The second calculates local routes to connect with the structuring network. In this scenario, with a view to the well-being of cyclists, it is necessary for the two configurations mentioned to exist, so that both can connect and consequently fulfill the purpose for which they were created.

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It is worth noting that these networks include exclusive circulation routes for cyclists, characterized by cycle paths and cycle lanes. The first mechanism can be defined as: a space segregated from the roadbed where there is a physical barrier to increase the level of safety. The second model, on the other hand, has no physical barriers and can be defined as a space in the roadbed that is intended for the exclusive use of cyclists and is delimited by a red stripe on the asphalt (ITDP, 2017).

The infrastructure analysis is based on the book Global Street Design Guide, which addresses issues related to urban mobility, such as accessibility, distribution of space, appropriate furniture and more, taking into account not only the journey itself, but also the benefits that an appropriate street configuration can bring to its users, such as a better quality of life, safety and comfort.

In order to carry out the study, the following categories were taken into consideration, as indicated by the field research: 1) trees and landscaping, related to the level of thermal comfort that the region can offer, 2) horizontal and vertical signage, 3) protective corners, 4) safety and 5) street furniture.

4 URBAN MOBILITY SURVEY

Urban mobility contributes significantly to the development of cities, both because of its impact on environmental sustainability and because of its social importance linked to public transportation (Leitão; Ferreira; Costa, 2024). In this sense, in order to capture public opinion on issues related to the current situation of urban mobility in Tangará da Serra, a qualitative questionnaire was drawn up with the aim of collecting data to support the design decisions of this study, as well as exposing the level of satisfaction or dissatisfaction of those who were willing to answer the questionnaire. As described in the methodology.

The survey was available for 20 days and was designed using the Google Forms tool, disseminated through digital communication channels, precisely so that it would have a wider reach and could be answered using various means of communication, including cell phones, tablets and computers. In all, 57 people took part, aged between 15 and 60 or over, with a level of education ranging from no schooling to complete higher education. The following (Figure 2) shows the means of transport most used by citizens, the level of safety when commuting by bicycle and the possibility of migration for those who commute by motorized means to join the bicycle as their main means of locomotion in the existence of an adequate cycling system.

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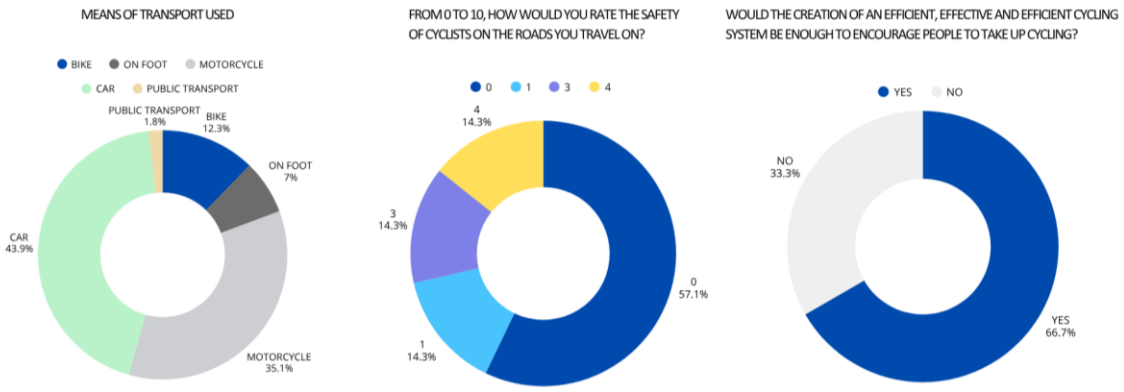
Figure 2 - Most used transportation, level of safety and the possibility of modal migration



Source: Authors, 2025

After analyzing the graphs above, it can be seen that a large proportion of those who answered the questionnaire said they travel by motorized means, with more than 80% of users. The bicycle appears with 12.3%, which is a relatively high figure for a city lacking appropriate cycling infrastructure. The second graph shows the opinion of those who commute by bicycle, showing the level of dissatisfaction people have with the high risk of safety when commuting, where 57.1% of users indicated that, on a scale of 0 to 10, the safety index is 0. This is followed by a technical tie between scores 1, 3 and 4, with 14.3% each. Finally, the last graph shows people's willingness to change their main means of transport with the implementation of an efficient, effective and efficient system, where 66.7% of users said they were willing to change their mode of transport. This information shows that there is a need for more stretches of road to be cycled and for these study areas to be readjusted.

4.1 Study Area

The study was carried out in the city of Tangará da Serra, located in the Southwest Mesoregion of Mato Grosso, 240 km from the capital Cuiabá. According to the latest IBGE census carried out in 2022, the municipality has 106,434 inhabitants, with a territorial extension of 11,636.825 km². It was a region first occupied by indigenous communities of the Bororó Umutina ethnic group and was emancipated in 1976. The municipality underwent a process of colonization in the middle of the 20th century, thanks to the actions of then-president Getúlio Vargas, with the March to the West (Tangará da Serra, [n.d.]).

In addition to the historical context of formation and the data presented, it is important to understand the socio-economic context of the users of this system. Economic indicators such as GDP per capita and average salary provide valuable information about the population's standard of living and consumption capacity. According to the IBGE in 2021, the city of Tangará da Serra has a GDP per capita of R$ 51,892.66, ranking 69th in the state. In terms of work and income, the average salary of formal workers is 2.3 minimum wages, ranking 8th in the state. As

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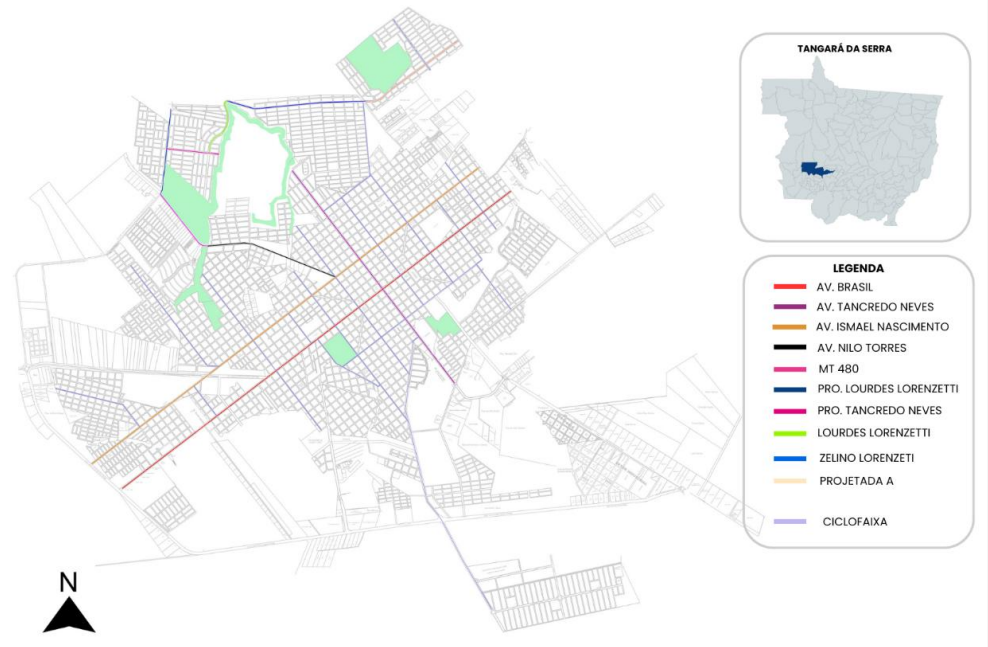
such, it is understood that the economic profile of many of these potential users is classified as low to middle income.

According to ANTP (2017), around 40% of journeys made in Brazilian cities are by active mobility. In addition, Urban Mobility Law No. 12.587/2012 establishes that active modes should be prioritized over motorized mobility. However, little infrastructure is allocated to these means of travel compared to motorized modes, which is also observed in the city under study.

Guaranteeing mobility in urban centers is essential to ensure equitable access to public and private spaces, favoring the population's quality of life, health and efficiency (Hannas; Moreira; Cruz, 2024). In this context, Tangará da Serra does not yet have a consolidated urban mobility plan, which results in a number of challenges, especially with regard to active mobility with an emphasis on cycling in the central regions. The city lacks structures that make it possible for cyclists to circulate safely, reflecting a lack of accessibility and poor integration of this mode of transport into the urban fabric. Therefore, Figure 3 shows the analyzed roads on which urban interventions will be proposed, including the readjustment of public spaces for active mobility.

It is worth noting that the right to mobility and urban accessibility is guaranteed in the Urban Mobility Law, number 12.587/2012, according to article 6: “priority of non-motorized modes of transport over motorized ones and of collective public transport services over motorized individual transport”

Figure 3 - Study area



Source: Tangará da Serra, 2025 edited by the Authors

After looking at the sections of the study highlighted on the map (Figure 3), then at (Figure 4), you can see some images taken during the on-site survey of the main roads in the municipality. The roads classified as arterial due to the flow of cars and the existing structure

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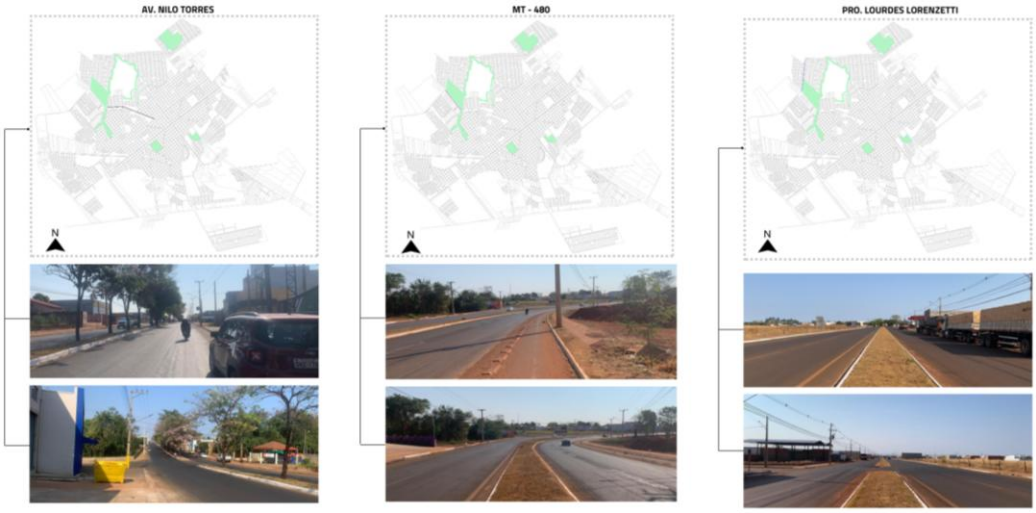
are Avenida Brasil, Avenida Tancredo Neves and Avenida Ismael Nascimento. According to the illustrations presented, there is a lack of accessibility and, consequently, of cycling infrastructure for the circulation of bicycles, thus prioritizing circulation by motorized means.

Figure 4 - Study area

Source: Authors, 2025

Figure 5 shows the current situation of Avenida Ismael Nascimento, Avenida Prolongamento Lourdes Lorenzetti and MT-480. It is worth noting that, among the roads analyzed, the state road has a portion of space for cyclists, but its dimensions do not follow the guidelines of the Global Street Design Guide. There is also a lack of trees to provide a minimum of thermal comfort and no signage.

Figure 5 - Study Area



Source: Authors, 2025

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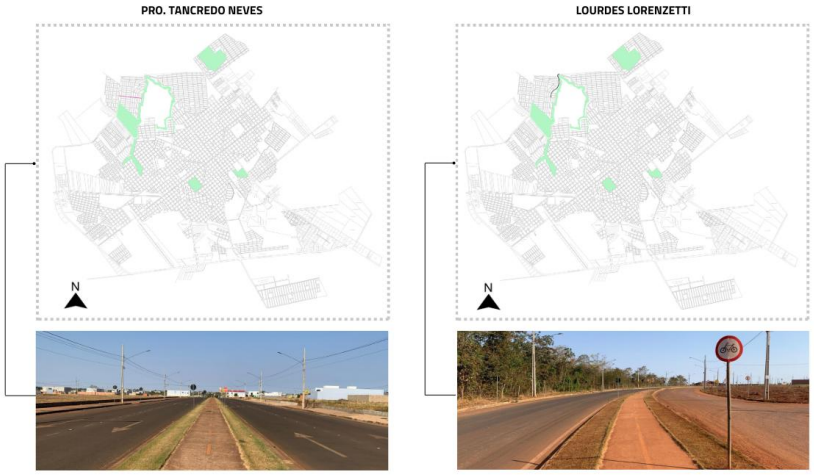
The next roads on this network are the Tancredo Neves and Lourdes Lorenzetti avenues, as shown in Figure 6. It is important to emphasize that on this route there is also a part of the road segment that is intended for cyclists, however, it does not follow the regulations in terms of width, as well as being devoid of trees and signage.

Figure 6 - Study area



Source: Authors, 2025

Finally, the last avenues analyzed were Zelino Lorenzetti and Projetada “a”. Figure 7 shows the configuration of the roads and the distribution of spaces for each mode of transport. Thus, after identifying the sections shown, we can see that there is no structure for active mobility. On a positive note, these roads have a good concentration of green infrastructure, as shown in Table 1

Figure 7 - Study area

Source: Authors, 2025

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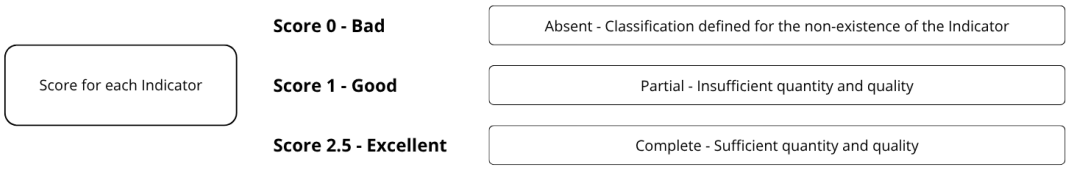
5 RESULTS

After looking at the condition of the infrastructure that makes up each street, this section will show the current situation, taking into account what is set out in the Global Street Design Guide. To put the analysis into context, figure 8 shows the definition of the weights assigned to each parameter.

Figure 8 - Indicator scores



Source: Authors, 2025

Table 1 shows the elements considered to make the implementation of cycle paths feasible, based on the following indicators: vegetation, signage, protective corners and street furniture. It should be noted that the sum of these indices defines the current level of safety of the roads assessed, which can be classified into three categories: bad, good or excellent. Thus the bad classification corresponds to values between 0 and 4; good, between 4 and 8; and excellent, between 8 and 10.

Table 1 - Current situation of the roads analyzed.

ROAD	INDICATORS				
	VEGETATION	SIGNAGE	P. CORNERS	FURNITURE	SECURITY
AV. BRASIL	1	1	0	1	3
AV. TANCREDO NEVES	1	1	0	1	3
AV. ISMAEL NASCIMENTO	1	1	0	1	3
AV. NILO TORRES	1	0	0	0	1
MT - 480	0	0	0	0	0
AV. PRO. LOURDES L.	0	0	0	0	0
AV. PRO. TANCREDO NEVES	0	1	0	0	1
AV. LOURDES LORENZETTI	0	1	0	0	1
AV. ZELINO LORENZETTI	1	0	0	0	1
AV. PROJETADA A	2,5	0	0	0	2,5

SECURITY CLASSIFICATION					
BAD		GOOD		EXCELLENT	
0 A 4		4 A 8		8 A 10	

Source: Authors, 2025

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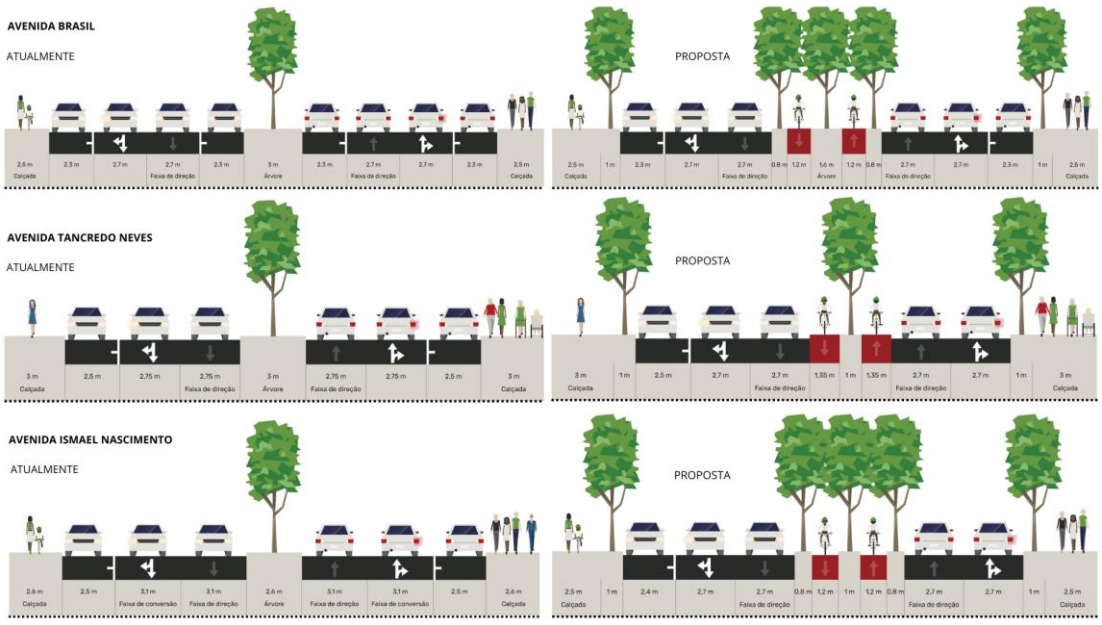
After checking in loco, evaluating the images on display, classifying the indicators and adding up the indices, it can be concluded that the current infrastructure is classified as insufficient to provide safety, comfort, agility and all the benefits of a cycling system. In this sense, in addition to readjusting the roadbed, it will be necessary to plant trees in some areas, apply horizontal and vertical signage where there is none or where it is damaged, adhere to protective corners and install new furniture, since some areas of the avenues analyzed don't even exist. As already mentioned, it would be necessary to redistribute the space destined for the roadbed, obliterating some parking lanes, as it is clear from the images that there are no roads that allow cyclists to circulate in some areas of the urban fabric of Tangará da Serra, making it irregular under Urban Mobility Law No. 12,587/2012.

Next, the analysis of the urban network, as well as the level of infrastructure, potential, points of attraction, public opinion and other constraints, made it possible to develop a proposal for intervention on some of the city's roads, with the aim of integrating the bicycle through the aspects that make up mobility, in order to provide accessibility for all individuals, regardless of their mode of travel. Thus, Figures 9 and 10 show the roads studied and the respective project proposals.

Figure 9 - Current situation and proposals for the roads analyzed block a



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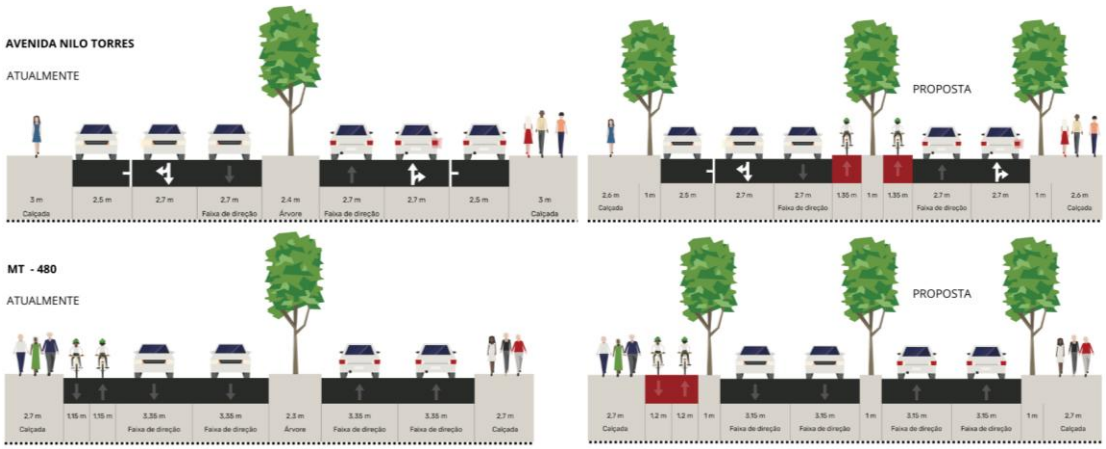
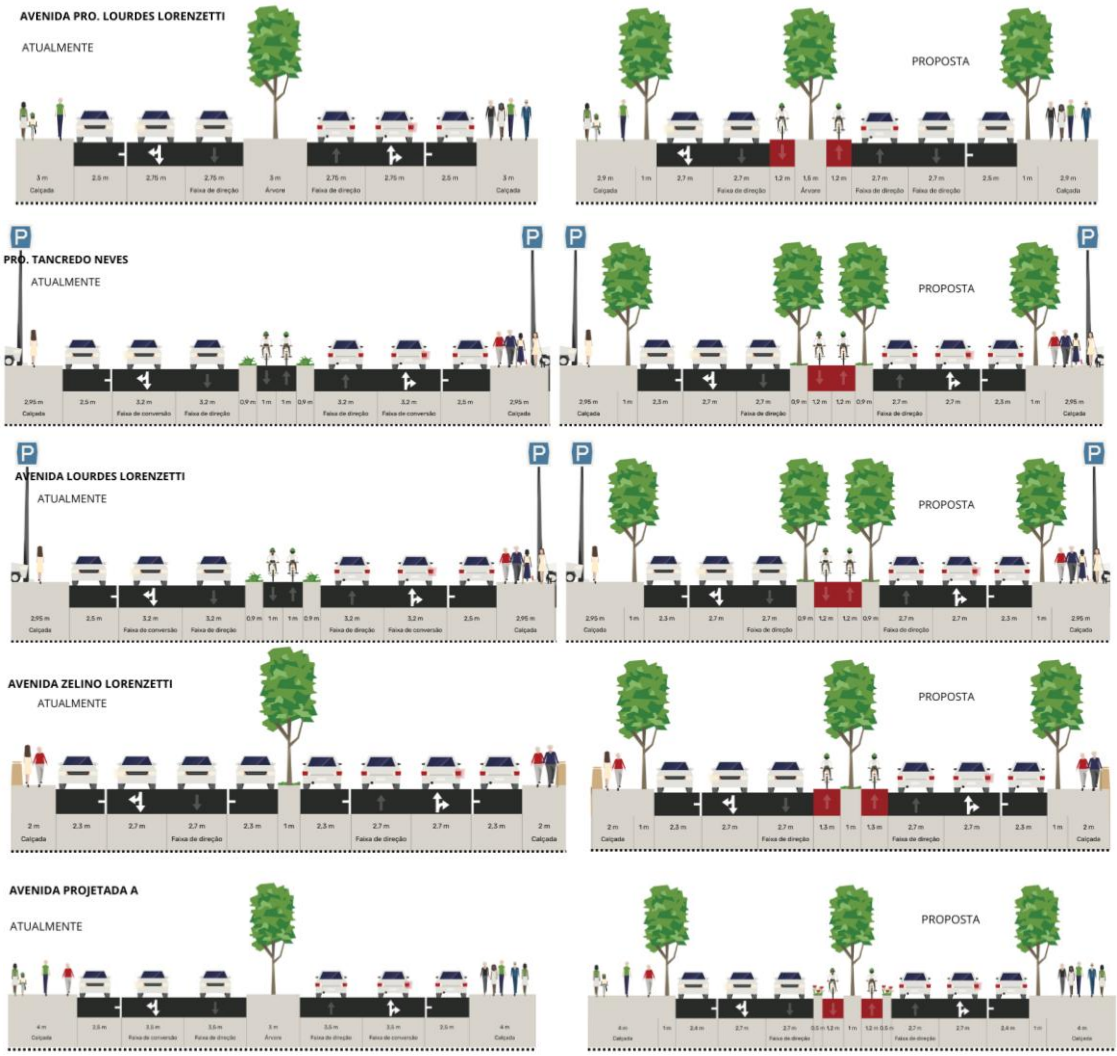


Source: Authors, 2025

Figure 10 - Current situation and proposals for the roads analyzed block b



Source: Authors, 2025

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According to Speck (2016, p. 90) "The automobile is the servant turned master". Given this scenario, after analyzing the images presented and comparing the current duality with the proposed adaptation, it can be seen that active mobility is disadvantaged compared to the motor vehicle. However, the study presented shows that some spatial redistribution interventions can provide accessibility, urban mobility and the right to "come and go" for these users. As such, one of the strategies applied in the readjustment of the roads was the exclusion of one of the parking lanes in one direction of the road. With this adaptation, in addition to the implementation of bicycle lanes in the central median, it is also possible to propose green infrastructure for pedestrians on both sides of the avenues. In relation to the avenues Prolongamento Tancredo Neves, Prolongamento Lourdes Lorenzetti and the state road MT - 480, there is cycling infrastructure, but they do not offer elements that provide greater thermal comfort, since there is no tree planting along the length of the roads. In addition, in the case of the two avenues mentioned above, the width of the traffic lanes does not meet the ideal width set out in the Global Street Design Guide of 2.40 meters, making it difficult for two cyclists to cross in opposite directions at the same time.

6 FINAL CONSIDERATIONS

This study sought to highlight the benefits of implementing cycle routes in parts of the city of Tangará da Serra, promoting mobility and urban accessibility for fans of active mobility, such as cycling. In addition, the survey involved the participation of fifty-seven people, as exploratory listening, pointing out possibilities for implementation with more careful studies in the future. In this scenario, it was possible to see that more than half of those interviewed were dissatisfied with the poor infrastructure in place to enable cyclists to get around. On a positive note, more than 60% of respondents who travel by motorized means said they would be willing to switch modes if infrastructure was put in place to provide safety, comfort, agility, security, effectiveness and efficiency. It can be concluded that, through the proposals presented, even if they have not initially reached an audience compatible with the current population, the municipality targeted in this study can count on a plausible solution to reorganize the commuting space and, consequently, adapt to the guidelines of the Urban Mobility Law, requiring the implementation of compatible public policies

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DECLARAÇÕES

CONTRIBUIÇÃO DE CADA AUTOR

A concepção e o design do estudo foram realizados por Alex Nascimento, com curadoria de Wesley Dias e análise formal conduzida por Gisele Carignani e Natallia Souza. O processo investigativo, bem como a definição da metodologia e a elaboração da versão inicial do manuscrito, ficou sob responsabilidade de Alex Nascimento. A revisão e supervisão final foram realizadas por Gisele Carignani, Natallia Souza e Wesley Dias. Por fim, vale destacar que o trabalho desenvolvido não teve financiamento de nenhuma instituição.

DECLARAÇÃO DE CONFLITOS DE INTERESSE

Nós, [**ALEX NASCIMENTO, GISELE CARIGNANI, NATALLIA SOUZA E WESLEY DIAS**], declaro(amos) que o manuscrito intitulado "[**Pedalando para o futuro: A integração da bicicleta na malha viária de Tangará da Serra – MT, como estratégia na redução das emissões de CO_2**]":

1. **Vínculos Financeiros**: Não possui/possui vínculos financeiros que possam influenciar os resultados ou interpretação do trabalho. (“Nenhuma instituição ou entidade financiadora esteve envolvida no desenvolvimento deste estudo”).
2. **Relações Profissionais**: Não possui/possui relações profissionais que possam impactar na análise, interpretação ou apresentação dos resultados. (“Nenhuma relação profissional relevante ao conteúdo deste manuscrito foi estabelecida”).
3. **Conflitos Pessoais**: Não possui/possui conflitos de interesse pessoais relacionados ao conteúdo do manuscrito. (“Nenhum conflito pessoal relacionado ao conteúdo foi identificado”).