Artigo

ANALYSIS OF THE EFFECTIVENESS AND SUSTAINABLE COMMITMENTS OF URBAN MOBILITY PLANS IN THE SERRA GAÚCHA METROPOLITAN REGION’S MUNICIPALITIES

ANÁLISE DA EFICÁCIA E DOS COMPROMISSOS SUSTENTÁVEIS DOS PLANOS DE MOBILIDADE URBANA NOS MUNICÍPIOS DA REGIÃO METROPOLITANA DE SERRA GAÚCHA

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ABSTRACT: Federal Law 12,587 of 2012, instituted and obliged federated entities to have a new vision of urban mobility. In 2013, the Região Metropolitana da Serra Gaúcha (RMSG) was created, currently composed of 14 municipalities, based on the identification of public functions of common interest in which mobility is inserted, the present paper aims to analyze the effectiveness of the plans for mobility of each municipality that makes up the RMSG, regarding to the basic guidelines of the Federal Law. Guidelines such as the elaboration of the urban mobility plan, effective popular participation in the preparation and monitoring, encouragement of sustainable means, integration with the metropolitan region, support for using non-motorized transport and public transport, as well as the actual implementation of the actions proposed by municipal legislation, with the aim of analyzing if what is actually proposed in the plans minimally meets the federal legislation and if it is actually being placed at the service of the population. For that, the paper was based on a qualitative and quantitative research.

KEYWORDS: Urban Mobility, Metropolitan Region, Sustainability.

RESUMO: A Lei Federal 12.587 de 2012 instituiu e obrigou entidades federadas a ter uma nova visão da mobilidade urbana. Em 2013, foi criada a Região Metropolitana da Serra Gaúcha (RMSG), atualmente composta por 14 municípios, com base na identificação de funções públicas de interesse comum nas quais se insere a mobilidade, o presente trabalho visa analisar a eficácia dos planos de mobilidade de cada município que compõe o RMSG, em relação às diretrizes básicas da Lei Federal. Diretrizes como a elaboração do plano de mobilidade urbana, participação efetiva da população na preparação e monitoramento, fomento de meios sustentáveis, integração com a região metropolitana, apoio ao uso de transporte não motorizado e transporte público, bem como a efetiva implementação das ações propostas pela legislação municipal, com o objetivo de analisar se o que é realmente proposto nos planos atende minimamente à legislação federal e se está realmente sendo colocado ao serviço da população. Para isso, o paper foi baseado em uma pesquisa qualitativa e quantitativa.

PALAVRAS-CHAVE: Mobilidade Urbana, Região Metropolitana, Sustentabilidade.
1. Introduction

From the 1960s, with intense urban growth in Brazil, especially in large cities and metropolitan regions, the mobility system began to register low-quality and high-cost rates, resulting in a negative impact on people's lives, both economic and environmental, with the decrease in the use of public transport and the increase in the use of cars being largely responsible for these consequences, according to Vasconcellos, Carvalho and Pereira (2011).

As a concept of urban mobility, according to ANTP (2007), defined in the Caderno de Referência para Elaboração de Plano de Mobilidade Urbana do Ministério das Cidades, it is said that "mobility is the result of the interaction of the movement of people and goods with the city". According to Gehl (2015), a major reinforcement of the objective of making cities sustainable is the unified political intervention, to ensure that people feel invited back to walking and cycling, in connection with their daily activities, creating ways to encourage interaction in spaces.

Portugal and Mello (2017) reaffirmed the need for Planos de Mobilidade to fulfill their transforming mission, based on permanent social participation, prioritizing and qualifying active transport and public transport, in an intermodal way, allocating resources and predicting short, medium and long term actions, in order to meet the needs of the society.

The Região Metropolitana da Serra Gaúcha (RMSG), created in 2013, in the Law 14,293, is formed by 14 municipalities, building a troubled area. Having in mind the importance of mobility in areas with this characteristic, the present paper uses this territory for its analysis of guidelines.

The proposal is to analyze, based on the mobility plans of the RMSG municipalities and theoretical references, whether they are being implemented and, if in fact, they can transform the life of the city and the
citizen’s, such as: compliance with imposed guidelines by Federal Law 12,587 of 2012, through popular participation in the preparation and monitoring of urban mobility plans, encouraging the use of public and non-motorized transport and the implementation of short, medium and long-term measures, in order to be achieved with the constitutional precept of ensuring an ecologically balanced environment for present and future generations.

2. Literature Review

2.1 The Context in the Metropolitan Regions

"Metropolis" is the expression used to refer to a "mother city", which wields influence on the surrounding cities, according to Ribeiro (2019). These cities are also centralizing hubs for the provision of the most diverse services, transforming them into high places and even the displacement of goods and inhabitants who live or are attracted by them. According to ONU-Habitat’s report (2011), half of the world’s gross domestic product (GDP) is concentrated in the economies of the two-hundred-largest metropolitan regions, attracting new investments, expanding the urban fabric, growing in density, in population and requiring greater levels of displacement daily. Due to these growths and the needs that they entail, a new legislation was created: the Estatuto da Metrópole, which was created to establish general guidelines for the planning and management of these regions.

The Law No. 13,089, of January 12 2015, that stablished the Estatuto da Metrópole, defines the metropolis as an urban space with territorial continuity that, due to its population and political and socioeconomic relevance, has national influence or a region that configures, at least, the area of influence of a capital. According to the criteria adopted by the Instituto Brasileiro de Geografia e Estatística - IBGE, the metropolitan region
is a regional unit established by the States, through a complementary law, built by a group of neighboring municipalities to integrate the organization, the planning and the execution of public functions of common interests and metropolitan area as the representation of the continuous expansion of the urban fabric of the metropolis, disturbed by the integration of road systems, covering especially housing, services and industrial areas with the presence of commuting in the territory. This legislation failed to advance in the creation of clear criteria for the formation and constitution of metropolitan regions, unlike what happened in the formation of the first regions in 1973, such as: São Paulo, Belo Horizonte, Porto Alegre, Curitiba, Salvador, Recife, Fortaleza, Belém and Rio de Janeiro in 1974. Currently, according to information from the base date of IPEA 2020, our country has legally constituted 75 RMs.

In Rio Grande do Sul, there are 2 (two) constituted metropolitan regions: the Região Metropolitana de Porto Alegre and the Região Metropolitana da Serra Gaúcha - object of study in this paper. In addition to these arrangements, there are two urban agglomerations, the South and the North Coast, as shown below:

Figure 1 – Metropolitan regions and urban agglomerations in RS.


Rio Grande do Sul, according to its Atlas Socioeconômico (2010) follows the same Brazilian trend by presenting a strong growth in the number
of urban inhabitants. The figure below shows the inversion of inhabitants from rural to urban areas, with a tendency of reducing the distance between them in the coming years and decades.

![Figure 2 – Urbanization rate in RS.](image)


As shown in figure 2, progressively, the population of *Rio Grande do Sul* has been concentrating in cities. According to data from the 2010 Census, the state currently has 85.1% of its total population living in urban areas. In *Serra Gaúcha*, this number is even higher, according to information from the state government, illustrated in table 1.

<table>
<thead>
<tr>
<th>Corede</th>
<th>Population (inhabitants)</th>
<th>Urbanization rate</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Serra</td>
<td>765.722</td>
<td>96.583</td>
<td>862.305</td>
</tr>
</tbody>
</table>


In this context, which is the object of study: A região metropolitana da Serar Gaúcha. According to the legislation, the region comprises 14 (fourteen) municipalities: Caxias do Sul, São Marcos, Flores da Cunha, Nova Pádua, Nova Roma do Sul, Ipê, Antônio Prado, Farroupilha, Garibaldi, Carlos Barbosa, Bento Gonçalves, Santa Teresa, Monte Belo do Sul and Pinto Bandeira. Table 2 shows some information for each municipality that makes up the metropolitan region.
Table 2 – Information of the municipalities that make up Região Metropolitana da Serra Gaúcha.

<table>
<thead>
<tr>
<th>Year of inclusion in the RMSG</th>
<th>Municipalities</th>
<th>Total population</th>
<th>Area</th>
<th>Demographic density</th>
<th>Urban rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>RMSG</td>
<td>Total</td>
<td>2020(1)</td>
<td>2019(2)</td>
<td>2020(3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(inhabitants)</td>
<td>(km²)</td>
<td>(inhabitants/km²)</td>
<td>(%)</td>
</tr>
<tr>
<td>2013</td>
<td>Antônio Prado</td>
<td>13.045</td>
<td>348,20</td>
<td>37,5</td>
<td>72</td>
</tr>
<tr>
<td>2013</td>
<td>Bento Gonçalves</td>
<td>121.803</td>
<td>273,60</td>
<td>445,2</td>
<td>92,3</td>
</tr>
<tr>
<td>2013</td>
<td>Carlos Barbosa</td>
<td>30.241</td>
<td>230,70</td>
<td>131,1</td>
<td>79,36</td>
</tr>
<tr>
<td>2013</td>
<td>Caxias do Sul</td>
<td>517.451</td>
<td>1.652,40</td>
<td>313,2</td>
<td>96,3</td>
</tr>
<tr>
<td>2013</td>
<td>Farroupilha</td>
<td>73.061</td>
<td>361,50</td>
<td>202,1</td>
<td>86,5</td>
</tr>
<tr>
<td>2013</td>
<td>Flores da Cunha</td>
<td>31.063</td>
<td>273,60</td>
<td>113,5</td>
<td>76,88</td>
</tr>
<tr>
<td>2013</td>
<td>Garibaldi</td>
<td>35.440</td>
<td>167,60</td>
<td>211,5</td>
<td>88,67</td>
</tr>
<tr>
<td>2013</td>
<td>Ipê</td>
<td>6.689</td>
<td>599,40</td>
<td>11,2</td>
<td>51,58</td>
</tr>
<tr>
<td>2013</td>
<td>Monte Belo do Sul</td>
<td>2.530</td>
<td>69,70</td>
<td>36,3</td>
<td>28,84</td>
</tr>
<tr>
<td>2013</td>
<td>Nova Pádua</td>
<td>2.558</td>
<td>102,70</td>
<td>24,9</td>
<td>29,88</td>
</tr>
<tr>
<td>2018</td>
<td>Nova Roma do Sul</td>
<td>3.717</td>
<td>149,10</td>
<td>24,9</td>
<td>47,41</td>
</tr>
<tr>
<td>2013</td>
<td>Pinto Bandeira</td>
<td>3.036</td>
<td>104,80</td>
<td>29</td>
<td>*</td>
</tr>
<tr>
<td>2013</td>
<td>Santa Tereza</td>
<td>1.726</td>
<td>74,10</td>
<td>23,3</td>
<td>36,5</td>
</tr>
<tr>
<td>2013</td>
<td>São Marcos</td>
<td>21.658</td>
<td>256,40</td>
<td>84,5</td>
<td>87,54</td>
</tr>
</tbody>
</table>

* The information was not provided because it was not available in the IBGE database during that period.


According to Lopes (2001), the criteria for regional planning aims to take advantage of the potential and homogeneity of a given region, promoting the development of cities, so that together they can join forces for their common interests, such as caring for hydrographic basins, transport, mobility and attraction of public and private investments, including in the MRs.

2.2 The (Human) Urban Mobility Difficulties

Ribeiro (2019) wrote that mobility became a mandatory item in territorial plans, both at the municipal and regional level, since 2012, where no city should be planned without taking into consideration the mobility offered, transformed into law, national urban mobility policy was a milestone that aims to integrate the different modes of transport and improve accessibility, mobility of people, cargo in the territory of the municipality and
region in a sustainable way. It is believed that there is a direct influence on the relationship of urban mobility, on the strategy to be verified in the mobility plans of each municipality and on their interrelationships with the quality of life and with the development of Região Metropolitana da Serra Gaúcha. Terán (2013), on the other hand, brings the theme of urban mobility as a systemic and broader phenomenon, covering not only the parts themselves, but their relationships (apud Avella Netto; Ramos, 2017). However, according to Ribeiro (2021), the automobile insertion, of individual property in the use of collective space, became a universal problem. With the popularization of the automobile and the massive occupation of these collective spaces, the way people live in cities changed significantly.

According to Pereira and Schwanen (2013), in metropolitan regions, the proportion of time-consuming of the commuting home-work lasting more than one hour increased from 15% to 17%, revealing that the pattern of mobility in Brazil, given the rapid growth of the Brazilian motorization index has been changing, bringing problems such as the increase in accidents, vehicular pollution and loss of time due to traffic jams (apud Avella Netto; Ramos, 2017).

In detriment of the increase in spaces for vehicles, spaces for pedestrians are becoming less attractive. According to Gehl (2015), the effort to deal with the growing number of automobiles, all available spaces were filled with moving or parked vehicles, and this configuration distances those who would seek the streets as a path to daily routes.

Brazil, as cited by Oliveira Filho and Vilani (2017), presents problems common to poor countries when it comes to transport, the disorderly expansion of the peripheries, growth in the use of individual motorized transport, congested roads, inadequate road system, little structure for non-motorized transport, delayed control tools, high number of traffic fatalities, unattractive public transport and high environmental degradation.
Mentioned by Harvey (2005), the history of public policy aimed at individual transport arises from the generation of incentives given to the American automotive industry, in particular, Ford, with mass production, generating large-scale consumption and transforming society (apud Mariotti; Osório et al., 2017). According to Hall (1995), the changes brought by Ford made the purchase of cars accessible to a large part of the population, which was previously a privilege of few (apud Mariotti; Osório et al., 2017).

As stated by Baldraia (2017), throughout the 20th century, the combustion engine became viable and automobiles became essential for the circulation of people, objects of desire and consumption, therefore, they occupied street spaces, later induced policies for creation of exclusive road spaces and finally became the reason why we have roads, starting to marginalize pedestrians.

According to data from the Agência Nacional de Transportes Públicos (ANTP), the 2018 Sistema de Informação da Mobilidade Urbana report, which analyzed the years 2014-2018, the numbers continue to grow. An important indicator is the inversion of position between collective and individual transport. In 2014, public transport was the second aggregated mode (after non-motorized transport), with 28.7% of the total trips, while in 2018, the second-place position was individual transport, with 30.5%. While the use of Individual Transport per inhabitant grew 11% in the period (2014–2018), the use of public transport and non-motorized transport decreased 3% in the same period (ANTP, 2020).

According to Terán (2013), the consolidation of individual transport occurs at the same time that collective transport entered the government agenda, which focused on all incentives in the 1980s and on the automotive industries (apud Avella Netto; Ramos, 2017). According to Vasconcellos, Carvalho and Pereira (2011), after the 1980s, there was an increase in car
use (from 32% to 49%) and a fall in the use of public transport (from 68% to 51% of the total of motorized trips).

The subject is not new, the book The Death and Life of Great American Cities, written in 1961 by the American Jane Jacobs, which already revealed the dramatic increase in car traffic and the modernist urbanistic ideology, which separates the uses of the city. In the same way, the writer harshly criticizes the transformation of urban spaces in New York, in favor of the automobile at the expense of pedestrians, resulting in lifeless cities, empty of people.

According to Gehl (2013), “[...] cities should pressure urban planners and architects to reinforce pedestrian areas as an integrated urban policy to develop living, safe, sustainable and healthy cities. At the same time, it is urgent to reinforce the social function of the city space as a meeting place that contributes to the goals of social sustainability for a democratic and open society”, Jan Gehl, Danish architect, experienced the transformation of the city of Copenhagen from a planned city for the automobiles in the 1960s to a city focused on people four decades later.

In 2007, the Stuttgart Declaration recognized mobility as a universal human right, being an important and memorable legal milestone. Ensuring this desire for a given society is an action that is difficult to carry out and, five years after the declaration, the Política Nacional de Mobilidade Urbana (PNMU) is enacted in Brazil (Brasil, 2012), with the aim of pointing to management and of power involved in dealing with this issue, it being necessary to consider issues related to the configuration of urban space, the modes of transport and the right to the city, in an interconnected manner (Baldraia, 2017).

The performance of the public authorities gains even more importance on the theme and, with this, a set of central federal norms for the planning of sustainable urban mobility is presented through the following devices: Law
10,257/2001, called Estatuto da Cidade, which gives general guidelines and instruments for urban development policy, Law 12.187/2009, called Política Nacional sobre Mudanças do Clima which seeks to ensure that economic and social development contribute to the protection of the climate system, and Law 12.587/2012, called the Política Nacional de Mobilidade Urbana, which institutes guidelines and provides municipalities with instruments to improve mobility in cities (Brasil, 2001; 2009; 2013).

The Estatuto da Cidade regulates urban public space to ensure the common interest for the territory to fulfill the social and environmental function of urban property. According to Oliveira Filho and Vilani (2017), the standard points out tools and establishes guidelines with a direct influence on urban mobility.

The Lei Federal da Política Nacional sobre Mudanças do Clima seeks to make socioeconomic development compatible with protection of the climate system and the environment as a whole (Brazil, 2009). Mobility management, according to Oliveira Filho and Vilani (2017), has a global challenge, related to air quality, and Federal Law n. 12,187/2009, aims to guide government actions, having a direct relationship with the effectiveness of actions established by Law 12,587/2012, which determines the task of municipalities to plan and execute the National Policy on Urban Mobility in a sustainable manner.

The Política Nacional de Mobilidade Urbana aims to promote integration between modes of transport and improve accessibility and mobility of people and cargo in accordance with the sustainability guidelines that seek urban development, social inclusion and environmental sustainability (Brazil, 2012). This policy aims to encourage the promotion of diversity, control of urban land, complementarity between modes and reduction of environmental, social and economic costs, either by encouraging the
adoption of renewable and non-polluting energies, or by prioritizing collective and non-polluting modes of transport (Oliveira Filho e Vilani, 2017).

Federal Law 12,587, on the other hand, requires all municipalities with more than 20,000 inhabitants to prepare an urban mobility plan integrated to the municipal plan, putting the deadline, according to Federal Law 14,000, until April 12, 2022 for cities with more than 250,000 inhabitants and until April 12, 2023 for cities with up to 250,000 inhabitants. All these procedures are based on principles of democratic management and social control of the planning and evaluation of the national urban mobility policy, under penalty of being prevented from receiving federal budget resources for urban mobility until they meet such requirement (Brazil, 2012).

Ribeiro (2021), in a very emphatically way, believes that the current model of car use is about to end, it means that people started to better analyze expenses and compare with other means of transport, which gradually led to change the thinking in relation to human mobility. Facing that, the public authorities had to face a new challenge. That is: implementing effective and sustainable urban mobility.

According to Rubim and Leitão (2013), it will be necessary to evaluate very rigorously the mobility plans of municipalities and regions, to avoid the implementation of pre-formatted documents, which do not necessarily have the capacity to transform the mobility and quality of citizens’ lives.

In January 2021, the Política Nacional de Mobilidade Urbana completed nine years of existence of a policy that should serve as a compass for carrying out policies in other spheres, such as the municipal one. However, after this period, and the Região Metropolitana da Serra Gaúcha completes eight years in 2021, do we have reasons to celebrate?
3. Material and Methods

3.1 Research Environment Characterization

The research environment is the fourteen municipalities that make up Região Metropolitana da Serra Gaúcha (RMSG), created according to Lei Estadual Complementar No. 14,293 of August 30, 2013, regarding the theme of urban mobility, collecting information if the municipality elaborated its mobility plan and, as it did, to analyze the guidelines of each document in relation to the studied bibliographies and Federal Law 12,587/2012.

The RMSG has the city of Caxias do Sul as its center, being the largest urban center in the region and the second most populous city in the state of Rio Grande do Sul. RMSG and Região Metropolitana de Porto Alegre are together a north-south axis of occupation with very dynamic economic characteristics. In 2020, according to IBGE population estimates, the set of 14 municipalities has a population of 864,018 inhabitants.

3.2 Objectives of the Research

The main objective of the study is to carry out an analysis of the effectiveness of mobility plans for the sustainable development of the municipalities that make up the metropolitan region of Serra Gaúcha, considering what was prepared by the municipalities, and what, in fact, was put into practice in cities for usage of the population.

Therefore, the secondary objectives are part of this context, as required by Federal Law 12,587/2012, and the law itself determines guidelines, aiming popular participation and sustainability that seeks urban development, social inclusion and environmental sustainability. However, considering the theoretical framework, presenting a series of problems in the
current mobility in large centers, the research will analyze whether the mobility plans of each municipality meet a more humanized view of mobility, prioritizing more sustainable and/or collective modes, such as:

   a) Analyze which of these municipalities have complied the obligation to prepare their urban mobility plan;
   b) Analyze whether the guidelines imposed by federal laws are met in said plan;
   c) Analyze whether, in the context of bibliographical references, the plan matches the expected vision of the future.

3.3 Techniques and Procedures

At first, the paper has based on a qualitative and quantitative research. In relation to its objective, it can be classified as exploratory. Köche (1997) highlights that this type of research is indicated in cases where there is not a set of theories and knowledge developed on the subject (apud Avella Netto; Ramos, 2017).

Data collection was based on information in bibliographic research and documentary research. The bibliographical research was focused on two themes: metropolitan regions, in the historical context, at the level of Brazil, state of Rio Grande do Sul and region under study and on urban mobility and its challenges.

As for the documentary research, this was carried out by collecting data on the websites of the city councils and city halls under study: first, to obtain the law that institutes the mobility plan of each municipality, as well as its annexes, and then analyzed in each plan the fulfillment of premises stipulated in the Federal Law, such as popular participation in the preparation and monitoring, in short, medium and long-term actions, in the
encouragement of collective and non-motorized transport, as well as in the regional integration of mobility plans for municipalities in study.

Finally, interviews were made with local authorities to analyze the effectiveness of the proposed plan, that is, whether what is described (goals) in the plan, with the appropriate budget allocation, has actually been put into practice. However, as an analysis of the most cited words in the referred plans was carried out, in view of their importance for the concept of the plan of each city.

4. Results and Discussion

4.1 Analysis of Compliance of the Construction of Mobility Plans, Effective Popular Participation and Regional Integration

In this session, the urban mobility plans of each municipality in the RMSG are investigated, when existing, and based on explicit or implicit references, that is, after analysis, whether for the preparation and monitoring of the implementation of the plan, there was or is popular participation, as required by Federal Law 12,587 of 2012, through evidence such as hearings, meetings and the creation of an implementation management committee, as well as whether the aforementioned mobility plan deals with the topic of regional integration. Chart 1 summarizes the aspects mentioned above.

<table>
<thead>
<tr>
<th>Municipalities</th>
<th>Is there the plan of urban mobility?</th>
<th>Are there integration guidelines for mobility?</th>
<th>Popular participation in PMOB elaboration?</th>
<th>Popular participation in PMOB monitoring?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Year of elaboration?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chart 1 – Analysis’ synthesis of the Mobility Plans of the RMSG regarding Regional Integration and Popular Participation.
4.2 Analysis of Incentives for Usage of Public Transport and Non-Motorized Vehicles

Municipalities that have an urban mobility plan were analyzed, in terms of encouraging the use of public transport and non-motorized transport, based on whether the plan provides for actions to improve the quality of services provided to users, such as punctuality, time reduced travel, passenger safety and adequate information available, whether there is a projection and actions to qualify the infrastructure for transport by bus, ensuring its priority on the public road through bus corridors, increasing productivity and reducing costs.

In this study, non-motorized vehicles such as bicycles were also considered. In this topic, it was taken into consideration whether the plans have actions related to the creation of cycling networks and the installation of bicycle racks, as well as the implementation of these incentives. Chart 2 summarizes the aspects mentioned above.

<table>
<thead>
<tr>
<th>Source: Author (2021).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antônio Prado</td>
</tr>
<tr>
<td>Bento Gonçalves</td>
</tr>
<tr>
<td>Carlos Barbosa</td>
</tr>
<tr>
<td>Caxias do Sul</td>
</tr>
<tr>
<td>Farroupilha</td>
</tr>
<tr>
<td>Flores da Cunha</td>
</tr>
<tr>
<td>Garibaldi</td>
</tr>
<tr>
<td>Ipê</td>
</tr>
<tr>
<td>Monte Belo do Sul</td>
</tr>
<tr>
<td>Nova Pádua</td>
</tr>
<tr>
<td>Nova Roma do Sul</td>
</tr>
<tr>
<td>Pinto Bandeira</td>
</tr>
<tr>
<td>Santa Tereza</td>
</tr>
<tr>
<td>São Marcos</td>
</tr>
</tbody>
</table>
Chart 2 – Synthesis of the analysis of the RMSG mobility plans regarding the encouragement of the use of public transport and non-motorized transport.

<table>
<thead>
<tr>
<th>Municipalities</th>
<th>Collective transport</th>
<th>Non-motorized transport</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Clear actions to encourage mobility plan?</td>
<td>Completion of encouraging plans?</td>
</tr>
<tr>
<td>Bento Gonçalves</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Farroupilha</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Garibaldi</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Santa Tereza</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>São Marcos</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Author (2021).

4.3 Evaluation of the Effectiveness of the Goals Stipulated in the Urban Mobility Plans

Among the municipalities analyzed, chart 3 summarizes whether the municipal law meets article 21 of Federal Law 12587 of 2012, which mentions that they must include identify clear and transparent objectives in short, medium and long-term objectives, as well as of the financial and institutional means to ensure its implementation and execution, analyzed in the budget laws of each municipality.

Chart 3 – Summary of the analysis of the RMSG Mobility Plans regarding the actions and budget allocation for the implementation of actions.

<table>
<thead>
<tr>
<th>Municipalities</th>
<th>Actions in short, medium and long term</th>
<th>Budget allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Are there short, medium and long-term actions?</td>
<td>Do the actions have a budget allocation in the current budget?</td>
</tr>
<tr>
<td>Bento Gonçalves</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Farroupilha</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Garibaldi</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Santa Tereza</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>São Marcos</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Source: Author (2021).
4.4 Analysis of Municipal Plans Regarding Objectives

4.4.1 Bento Gonçalves

The mobility plan of Bento Gonçalves was established by Law No. 5,996 of October 2015, with popular participation in elaborating the law, with hearings mentioned in the plan itself. The municipality created the Conselho de Mobilidade Municipal and the Fundo Municipal, stipulated in the municipal law, with due allocation, such as: 20% of IPVA revenue and 21% of the company responsible for the rotating parking, both in fact, found on the municipality's website, however, without information on meetings and allocated funds. It is worth noting that Chapter I of the law mentions its coverage on a regional scale, citing the guidelines with the RMSG.

Attachments 1, 2 and 9 bring intervention actions in public transport, with the creation of routes for priority circulation and execution of a cycling system, however, not implemented so far. The plan has clear short, medium and long-term actions, found on pages 64, 65 and 66 of part 03 of the plan, called Implementation.

Nevertheless, the municipality has a budget in 2021 for carrying out works linked to the plan. In conversation with technicians from the municipality, interventions mentioned in the plan were carried out in recent years, however, they did not know how to quantify or enumerate them, but cite interventions to access the North zone, as the most significant, with investment in around 3 million. However, the technicians have little information regarding the plan and already cite a possible revision.

The most cited words in the mobility plan, obtained through word clouds, are: Urban Mobility, Roads and Transport.
4.4.2 Farroupilha

Farroupilha’s mobility plan was established by Law No. 4202 of December 2015, with popular participation in the elaboration of the law, through public hearings, however, it has few mechanisms for monitoring the actions of that plan, being the transit council the only one in activity, not involving the community in general. Integration with the RMSG is not only mentioned in the critical points treatment booklet, but as a need for the regional train.

The legislation is very lean, and notebooks 1, 2 and 3 are regulated by decree, as a tool attached to the plan. The issue of public transport is not mentioned in the mobility plan, as it has its own legislation, not put into practice. Notebook 2, called Rede Cicloviária Integrada, brings actions for the execution of a cycling network in the city, with clear projects, however, without a prioritization schedule.

The plan has clear actions, in notebook 1, for dealing with critical points in current mobility, however, it does not establish short, medium and long-term actions. The current budget sees an allocation for the works mentioned in the plan, such as the continuation of the walking trail and bike path on Av. dos Romeiros. Since the elaboration of the law, the municipality has invested around 6.5 million reais in works mentioned in the mobility plan, both in bicycle lanes, and on Av. Armando Antonello and Rod. Dos Romeiros, both in the treatment of intersections and in the opening of Av. Armando Antonello, the creation of a road solution at the junction of Av. Santa Rita and at the intersection of RS 122 and RS 813. The municipality, through local authorities, has been developing several paving, but these are not included in Farroupilha’s mobility plan.

The most cited words in the mobility plan, obtained through word clouds, are: Urban Mobility, Roads and Public Transport.
4.4.3 Garibaldi

Garibaldi’s mobility plan was established by Law No. 5,266 of December 2019, with popular participation, according to information on the municipality’s website. The legislation mentions the creation of a monitoring mechanism, the Conselho Gestor da Mobilidade Urbana de Garibaldi, which will be created by decree, however, not presented so far. The plan only mentions the metropolitan region in the public transport guideline, which must be analyzed regionally.

The law, in art. 20, cites guidelines for prioritizing public transport and non-motorized transport, with the creation of priority routes and integration of modes, however, without a schedule of actions, it makes it difficult to monitor the implementation of the proposed goals. Articles 28, 29 and 30 indicate that a municipal cycling master plan will be drawn up, which does not exist yet.

However, the municipality does not have a budget for actions and goals of the mobility plan, and information on actions carried out since the law was in force was not obtained from the responsible Secretariat. The most cited words in the mobility plan, obtained through word clouds, are: Movement, Transport and Public Transport.

4.4.4 Santa Tereza

Santa Tereza’s mobility plan was established by Law No. 1595 of October 2019, and elaborated with public hearings together with the master plan. The aforementioned law provides for the creation of an urban mobility council, which would collect indicators every 3 years, but so far there are no follow-up meetings. It is also appropriate to say that the Santa Tereza plan does not mention its integration with the RMSG.
Article 6 of the plan brings the theme of hierarchization of modes, prioritizing non-motorized transport and public transport in relation to individual motorized transport, however, only as a guideline, without any action or measure to implement the guideline.

The legislation, which is quite streamlined, does not provide clear short, medium and long-term actions, which comes closer to actions and the requirement of a year to prepare the tree and sidewalk guide, as in article 35. The municipality does not have a budget allocation for interventions related to the mobility plan. In the analysis of effectiveness, it is observed that a guideline stipulated in article 27, in the aspects of operation and disciplining of cargo transport in the road infrastructure and the restriction on the use of vehicles with a total gross weight above 15 (PBT) in the historic core area, but with a free corridor, with no load restriction between the streets Abramo Caumo/Cesar Appiani, Helvécio Lisboa and part of Avenida Itália, as mentioned by the responsible agency, the item is now in happening.

The most cited words in the mobility plan, obtained through word clouds, are: Transport, Mobility and Public transport.

### 4.4.5 São Marcos

São Marcos’ mobility plan was established by Complementary Law No. 59 of October 2019, with popular participation in the elaboration of the law, through public hearings, however, it does not have mechanisms for monitoring the actions of that plan. Integration with the RMSG is cited, without concrete actions, just as a guideline.

Article 15 of the plan deals with the theme of public transport, it describes improvements to be elaborated for a better service provided to the population, however, without a concrete schedule or clear actions for its implementation. In article 22, the legislation requires the placement of
bicycle racks in public transport terminals, public buildings, schools and industries, not creating cycling networks.

The plan does not have clear short, medium and long-term actions and article 9 mentions extensions of existing roads to be carried out over time, detailed in appendix 01 of the mobility plan. The current budget does not foresee an allocation for the works mentioned in the plan. Since the elaboration of the law, the municipality has invested around 15 million reais in paving urban and rural roads, and improving the city's public footpath, and these works are not included as an action in the mobility plan, but according to information provided by technicians from the municipality, aim to improve mobility and leverage rural tourism, items cited as guidelines in the São Marcos plan.

The most cited words in the mobility plan, obtained through word clouds, are: Transport, Mobility and Street.

5. Conclusion

In general, the analysis of the municipalities in RMSG, regarding the preparation of mobility plans and compliance with federal legislation, proved to be far from what is required. Of the fourteen municipalities, only five (Bento Gonçalves, Farroupilha, Garibaldi, Santa Tereza and São Marcos) have elaborated their urban mobility plans, another three (Flores da Cunha, Carlos Barbosa and Antônio Prado) are starting studies for a possible public call that will prepare the municipal plans. It draws attention to the host city, and the most populous, of the RMSG, Caxias do Sul, that it does not have its urban mobility plan in force or in progress, given the short deadline to comply with federal legislation.

The municipalities that put in practice their plans do not fully comply the Federal Law No. 12587/2012. The five had popular participation in the
elaboration of the municipal law, however, in none of the cases there is an effective follow-up by the population to implement them. It should be noted that only Bento Gonçalves and Farroupilha have had the plan for more than 5 years and only Bento Gonçalves has in their legislation the resources for implementing the plan clearly.

Three plans show clear actions to encourage public transport or non-motorized transport, and only Farroupilha implemented actions with regard to structure for bicycles, and no municipality implemented incentive actions prioritizing public transport.

Bento Gonçalves and Farroupilha, in their legislation, have clear actions, however, only Bento Gonçalves with a time limit. Both have in their budget for 2021, allocation for the execution of works mentioned in the mobility plan. It is also noticed the low investment compared to the annual budget of each municipality, as both Bento Gonçalves and Farroupilha did not invest even 1.00% of their budgets over the last five years in implementing their urban mobility plan.

The most cited words in the mobility plans demonstrate the law's interest in improving public transport, however, no municipality has taken real action to do so, so far. Also, there was a low incidence of words such as sustainability, pedestrians and bicycles, given that, there was only focus on mobility on roads for motorized vehicles and not for people. Mobility plans need to look at the city and not at car traffic, aiming at a better quality of life for people in the city. Therefore, it is known that a shift to the use of active transport (cycling and walking) and public transport, combined with better land use, can bring greater indirect health benefits than through increased vehicle efficiency.

Integration with the RMSG is also little mentioned in the plans, with only Bento Gonçalves and São Marcos doing it. Therewith, there is a clear need to carry out a Regional Mobility Plan for the municipalities under study,
many of which already have contiguous areas, in law, in planning and in the theme of urban mobility, thus meeting Federal Law 13,089 of 2015.
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