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Active Mobility: A study on Walkability in the city of Blumenau/SC

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SUMMARY
This research addresses aspects related to active urban mobility focusing on the understanding of walkability and the criteria that condition it. Walkability is a preponderant factor in the quality of urban space, as it is about the characteristics and conditions that a place presents for walking. In this context, this research carried out an analysis of walkability in four urban space clippings of the city of Blumenau/SC. A method for evaluating the walkability was applied, and thus the indexes for each area were identified; furthermore, interviews were carried out through a questionnaire with the objective of knowing the profile of the walker, his/her characteristics and perceptions. Thus, it could be concluded that the walkability in the researched areas shows a direct relationship between the attractiveness of the space, either by the safety conditions in all senses, by points of attraction, such as shops and services or outdoor living areas, or even by a pleasant sightseeing, added to the conditions of urban infrastructure of the sidewalks, much more than just the characteristics of the rugged terrain.

KEYWORDS: Walkability. Active Urban Mobility. Land Use.

1 INTRODUCTION

Following the global trend, Brazil in the beginning of the 21st century already presented itself as a predominantly urban country, with approximately 82% of its population already residing in cities with urban characteristics. Therefore, making cities more humane and egalitarian through interventions in transportation systems, improvements in urban mobility and accessibility have become one of the biggest priorities and challenges of public policies in the country (ALMEIDA, 2011).

In this context, walkability becomes the bias of the urban mobility process that prioritizes the smallest movement, making it of utmost importance for the city's urban planning process, rescuing the value of social relations and making the human being the protagonist of the city. Jacobs (2011) makes it clear that it is through walking that people get to know each other and talk, creating interactions and relationships with their neighborhoods. This dynamic is what keeps the city alive and safe, but this relationship only happens when the urban space is structured to receive people, inviting them to the street.

The displacements that are made by people, even in great distances, at some point of this process will happen on foot. In face of this panorama comes the question of how to make sidewalks and urban spaces walkable and accessible, respecting the limitations of people in moving around, whether in cities with flat topography, or in urbanized cities that have an irregular topography, such as the city of Blumenau.

Blumenau has a road system with few arterial roads connecting the neighborhoods to the center, and most of them are still from the colonial layout, with winding and narrow streets. This limited capacity and the incentive for mobility by individual motor vehicle currently presents constant congestion in the city, and as of 2011 exclusive bus lanes were implemented in the central region of the city as measures to reduce this congestion (PATEIS, 2013).

The municipality has still prioritized the circulation of motorized private vehicles, and only recently have there been glimpses of development policies for active transportation still very timidly. (BLUMENAU, 2018).

It is with this conjuncture in mind that this research aims to evaluate walkability and its relationship with accessibility and attractiveness in urban space, through an analysis of spatial clippings of the city of Blumenau/SC.

2 THE PEDESTRIAN AND THE URBAN SPACE

Being a pedestrian is a condition inherent to human beings, everyone who walks, rides a bicycle, or sits or lies down in public space is considered a pedestrian, including people in wheelchairs. Even if we still use a collective or individual means of transportation, at some point along the way we become pedestrians, that is, we are pedestrians first and foremost.

With the growth of cities and the need to travel long distances, besides the ease of transporting objects and goods, man developed vehicles and traction systems. At this moment the pedestrian starts to have a new condition, that of driver and passenger. This relationship, however, does not rule out the position of the human being as a pedestrian at some point, and in view of this fact it can be said that we are pedestrians and only drivers and passengers. The importance of this understanding becomes necessary before the precept that the pedestrian is, or at least should be, the protagonist of the public space (DAROS, 2000).

Since the twentieth century the concepts of urbanization have changed radically, where urban planners and public administrators began to "reclassify" urban spaces, as in the United States, which remodeled the territory by encouraging urban sprawl, reducing density and creating the city on the scale of the car, the vehicle becoming the conditioner of the modernist urban design. And this milestone made the vehicle a necessity, as walking became impossible (SPECK, 2017).

This vision was replicated in numerous cities, including in Brazil, such as Brasilia, which through the pilot plan and its large blocks, the scale of the car was accentuated giving greater importance to the vehicle than to the pedestrian. In a conference held by the United Nations Organization (UNO) in Madrid in 2017, Gehl stated that Brasilia is fantastic for those who can see it from above, from the top, but totally inaccessible from the ground, where people live.

In the search for a more sustainable urban development, many researches and studies have been trying to equalize and understand the functions of the current urban transportation systems, in addition, it is of utmost importance that these systems are truly sustainable, that is, transportation mechanisms that do not use fossil, non-renewable fuels. Within this perspective non-motorized systems such as cycling and walking gain relevance again. It is worth pointing out that walking, besides being sustainable, is the most economical, democratic, and highly healthy transportation system.

Although the pedestrian has historically been ignored in previous urban projects, walking has never ceased to be an essential mode of transportation in any city. Even in daily trips, with the use of other means of motorized transport, walking will always be present, whether from the parking lot to the building, from home to the bus stop, or any other route, because every urban journey involves walking.

But it is not enough just to increase sidewalks, life on the sidewalks is also encouraged by other factors as Jacobs (2011) points out, a street needs businesses, but businesses that present amenities for people, that are useful for their daily lives, so people will leave home on foot and not by car, and they can meet their neighbors and strengthen community life. In addition, there is to be concerned with the human scale, which is that of the

pedestrian, what he can observe and feel when he is on the street, because nobody likes to walk from sameness to sameness, from repetition to repetition, even if the effort is minimal.

All these conditions are essential for the pedestrian to live the urban space, and to be truly stimulated to leave home on foot.

3 WALKABILITY

Walking has drawn increasing attention from urban planners and researchers, however, it is necessary to understand the motivations that make people walk, and for this purpose, many studies have been conducted in recent decades in order to investigate the walkability in cities.

Walkability is a term used to reflect the frequent conditions of the examined urban space, and this analysis can comprise several scales, from an urban section, a neighborhood or the whole city, to routes and road segments, the latter being the focus of this research. Through indicators, which will result in data about the spaces, it is possible to understand which places are more attractive for walking and which points need to be improved because they hinder or discourage walking.

From a conceptual point of view, walkability comes from the English term walkability, which can be translated into Portuguese as the characteristics and conditions that a place presents for walking. These characteristics, when positive, allow people to move around safely and satisfactorily. Thus, the study of walkability will serve to identify the points that need to be improved, as well as strengthen the positive points, in order to encourage walking (ZABOT, 2013).

4 WALKABILITY INDICES

Pires (2018) conducted a research among the indices of walkability already developed over the years, and identified the main indices for evaluating walkability, the study presented a synthesis of 23 methods of evaluating walkability, and that stand out for considering different scales of analysis the indices developed by (SANTOS, 2003, HALL, 2010; CAMBRA, 2012; ZABOT, 2013 and ITDP, 2018).

Researchers such as Santos (2003); Ewing et al. (2004); Zabot (2013); ITDP (2013; 2015; 2018); Singh et al. (2015) and Grieco (2015) are examples of the application by segment, and evaluate the total area of the segment, without admitting punctual examinations that end up guaranteeing a lower degree of subjectivity.

Thus, it is believed that for this study the walkability index developed by Zabot (2013), which considers the evaluation of 12 analysis criteria, identified in Table 1 and pointed out by the author as the variables of higher occurrence among the criteria for analysis of walkability; is the most appropriate.

Table 1 – Walkability evaluation criteria, ZABOT (2013).

Variable	Approach
Accessibility	Sidewalks with tactile flooring and ramps
Visual Attractiveness	Pleasant surrounding use
Barriers	Obstacles
External Conditions	Weather Protection
Urban Design	Street widths and vehicle speeds Ease of access to other means of transportation Block size
Pedestrian Infrastructure	Street Furniture Signage Vegetation Lighting
Sidewalk Width	Cross extension width
Maintenance	Pavement Condition Sidewalk Cleanliness
Safety	Floor Type Leveling Crossing the streets
Safety	Pedestrian presence and policing
Topography	Longitudinal slope
Land Use	Diversity of land use

Source: ZABOT (2013), adapted by the authors.

The methodology adopted by Zabot (2013) is actually an adaptation of the method of Santos (2003), researcher at the Pontifical Catholic University - Paraná (PUC-PR). This adaptation occurred through the inclusion of two variables, (topography and land use) which Santos (2013) did not work with. Zabot's (2013) justification for the inclusion of these two variables was due to having found that such variables were pointed out by other authors in their research, as relevant items of analysis of walkability. However, the scoring criteria, the method for assigning points and the final evaluation remain the same as the methodology of Santos (2003).

5 BLUMENAU

Blumenau is located 140 km from the capital of Santa Catarina, Florianópolis, as can be seen in figure 01. It has a road system with few arterial roads connecting the neighborhoods to the center, and most of them still from the colonial layout, with winding and narrow streets. This limited capacity and the incentive for mobility by individual motor vehicle currently presents constant congestion in the city (PATEIS, 2013).

Siebert (2000) believes that due to the centralization of urban equipment, commerce and services and the lack of connection between neighborhoods were the main responsible for the various mobility problems faced by the city until today.

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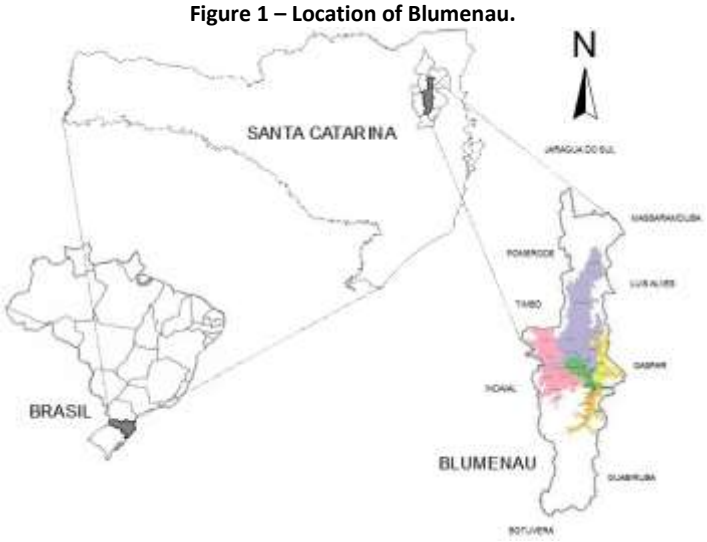
Figure 1 – Location of Blumenau.



Source: IBGE (2010), adapted by the authors.

According to Piazza and Vieira (2017) the city of Blumenau currently uses the motor vehicle as the main mode of transportation. However, a large part of the population uses public transportation. As of 2011 exclusive bus lanes were implemented in the central region of the city, these measures arose from the need to reduce the numerous traffic jams caused by people moving from the peripheral neighborhoods to the center, where most public services and major shops and private services are located.

6 METHODOLOGY

The methodological approach that met the problematic of this research was descriptive, because it sought the understanding and the relationship of some variables, as well as the knowledge of the reality at the time of the research.

Considering the current situation of urban mobility pointed out by the City Hall, the definition of the spatial clippings used in the research, considered the crossing and analysis of some important variables, such as population, income and slope of these areas, because it was possible to elect regions of the city with higher population and distinct characteristics between them, especially with regard to income and slope. Thus, through the 2010 IBGE data, information was gathered about the thirteen most populated neighborhoods in the city of Blumenau/SC, as well as the nominal monthly income equivalent to the minimum wage in force at the time, considering the amount received by the largest number of residents in the neighborhood. Income is an important variable to be considered, because it represents a significant impact on the way people live, which includes the way they commute.

Another important element to be considered is the slope of the analyzed place, the slope considered refers only to the areas of greater movement of people in the neighborhood, where there are points of attraction and coexistence, which according to Jacobs (2011) are the

places that present characteristics that stimulate people to live the urban space, walk and socialize in an active or passive way.

In this sense, correlating the variables, population, income and slope, it was decided to elect four spatial clippings, thus each clipping presents relevant characteristics regarding these variables and contemplates similar characteristics provided in the other neighborhoods of the city. The first of them, the Itoupava Central neighborhood, has the largest number of inhabitants and income similar to most of the other neighborhoods, besides a slope between 5 to 12%, considered intermediate in relation to the others. It is worth noting that the municipality has an Urban Development Plan - Blumenau 2050 - which provides for the expansion of the city to the north, where this neighborhood is located. The second clipping is in Itoupavazinha, the third most populous neighborhood in the municipality, and stands out from the others in terms of income, presenting one of the lowest incomes of 1 to 3 minimum wages (IBGE, 2010), and slope of 12 to 20%, considered high. The third cut is in the Garcia neighborhood, the fifth most populous neighborhood, with an average income of 1 to 5 minimum wages, and slope of 0 to 5%, considered low, which motivated the choice of this area. And finally, it is worth noting the importance of analyzing an area that presents higher income than the other neighborhoods, so we chose the Vila Nova neighborhood, which has an average income of 3 to 10 minimum wages, and slope of 0 to 5%.

After defining the clipping, each road segment, each stretch existing between the intersections of the roads was individually analyzed, both on the left and right side of the road. This analysis consisted in verifying the existence, or not, total or partial of each of the twelve variables indicated in chart 01, and each variable received scores in three intervals, being 0.00 (zero) for situations not met, 0.25 (zero point twenty-five) for situations partially met and 0.5 (zero point five) when it was fully met.

The definition of the extension of the cutout that was analyzed in each area corresponds to a maximum of approximately 2 km, in the longitudinal direction of the main roads in the selected neighborhoods. This definition took into consideration the research of Junqueira (2003) who states that people are willing to walk up to 1km. For Gehl (2015) the ideal measurement is between 500m and 1km. Litman (2010) believes it is up to 800m. And Speck (2017) goes a bit further and considers up to 2km. In view of this, it was decided to choose a more generous cut-off of up to 2km that encompasses the dimensions of all the authors mentioned.

For the field research, an analysis and evaluation form was used, so after the attribution of points for each variable in each stretch, as described above, the scores of each one were added and divided by two, so that the average of the analyzed stretch could be obtained, that is, this average represents a walkability index for each stretch. It is worth noting that this analysis methodology was applied exactly as suggested by Zabot (2013) and Santos (2003) in their research. Thus, the result of the walkability index for each stretch can be evaluated by intervention priority.

Using quantitative research, but also introducing the qualitative method, we sought to know the profile of the walker, and for this a questionnaire was applied with the purpose of tracing a socioeconomic and cultural profile of the walker, to know the reasons for walking, the difficulties, facilities and, above all, the arguments that explain the reasons for walkability.

For the composition of the sampling of people, the non-probability statistical method was used1, The questionnaires were applied in the four areas, between September 21 and October 9, 2020, at alternate times between 8 am and 9 am, between 11 am and 12 pm, between 1 pm and 2 pm, and between 5 pm and 6 pm, in order to obtain a diversity of reasons and different days among the walkers.

7 RESULTS

The evaluation of walkability occurred through the analysis of the areas by stretches. Thus, each area had a different total of stretches, with Area 1 - Itoupava Central neighborhood having 16 stretches; Area 2 - Itoupavazinha neighborhood, 17 stretches; Area 3 - Garcia neighborhood, 28 stretches and Area 4 - Vila Nova neighborhood, 18 stretches. This field evaluation took place between September 7 and 18, 2020, on alternate days, from 8am to 10am, and from 4pm to 6pm. After tabulating the data, it was possible to know the walkability index for each stretch and reflect on which factors contribute to a higher or lower performance, considering that the walkability index represents how inviting and pleasant that urban space is for people to move around.

7.1 Area 1 – Itoupava Central neighborhood

Area 1 comprises a 2.2km extension of the Pedro Zimmermann street, and presents an average walkability index of 3.96 points, considered low, and of immediate intervention. This index reflects a series of identified problems and even the nonexistence of several attributes necessary for good walking conditions.

The indexes for sections 11, 12 and 15 were the ones that presented the lowest scores, as they received zero scores in most of the variables analyzed. What draws attention is that sections 11 and 12 are located in the access to a residential subdivision, which contributes negatively to the stimulus in walking for the residents.

In most stretches, the lack of accessibility, the high speed of vehicles on the road, the unsafe crossing for pedestrians due to the lack of crosswalks and traffic lights, in addition to the absence of urban furniture, vegetation and protection against the weather, and the numerous irregularities on the ground, such as holes and lack of paving in several stretches were determining factors in this low result of the walkability index. On the other hand, the topography variable presented the highest score, because it is a predominantly flat relief, followed by the ease of access to public transportation and a more diversified land use among residences, stores in general and mixed use of buildings in several sections, besides blocks smaller than 100 meters in others, however, not enough to raise the average of the walkability index.

The figure 2 visually illustrates in the area, the walkability situation according to each stretch.

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Figure 2 – Walkability situation by sections, Itoupava Central neighborhood.

INTERVENTION PRIORITY	WALKBILITY INDEX	STRETCHES
Critical Situation	0,00 a 1,99	
Immediate Intervention	2,00 a 3,99	1 - 2 - 4 - 6 - 7 - 10 - 11 - 12 - 15 - 16
Short-term Intervention	4,00 a 5,99	3 - 5 - 8 - 9 - 13 - 14
Improvement and Refinement	6,00 a 10,00	

Source: Priority criteria, SANTOS (2003), illustration elaborated by the authors 2020.

A relevant point to be considered is that the stretches with smaller blocks have better scores compared to the stretches with larger blocks, this fact contributes to reducing distances and allowing greater connection for displacement.

In this sense, we can conclude that the analysis carried out points to the need for immediate intervention in 10 of the 16 sections, showing a situation of unfriendly walkability for the displacement of people circulating in the region.

7.2 Area 2 – Itoupavazinha neighborhood

The analysis of walkability in area 2 comprises part of Frederico Jensen Street, approximately 1.7 km of the street, which is the main street of the Itoupavazinha neighborhood, being the region of greatest movement of people. However, it presents an average walkability index of 4.48 points, classified, according to Santos (2003), as an area for short-term intervention, unlike area 1 which required immediate intervention, area 2 is in a more favorable situation, but not fully satisfactory for displacement.

What draws immediate attention is section 11, which stands out from the others for presenting a score of 7.25 points, a satisfactory result, requiring only improvements and refinements. This is due to the fact that this stretch is located in front of the Felipe Schmidt School, and the entire stretch has been recently re-qualified, on both sides of the road, and thus presents good walking conditions. However, this good performance is punctual and appears only on this single stretch of road, because the previous and subsequent stretches have 5.75 and 4.38 points, respectively, with scores similar to the others.

In general, the variables that received low or zero scores are related to the lack of urban furniture and protection against the weather; besides the few bus shelters that had coverage and benches for more comfort while waiting. And also the low presence of the elderly and children, and no policing during the research period, criteria that, according to Santos (2003), corroborate in the understanding of the quality of security of the place. And finally, the steep slope, which was to be expected, since this was one of the reasons for selecting the area for the research.

In the opposite direction, the cross leveling criterion of sidewalks, with a slope of less than 2%, and the size of the blocks, being less than 100 meters, proved satisfactory in relation to the other variables analyzed.

Figure 3 visually illustrates in the area, the walkability situation according to each stretch.

Figure 3 – Walkability situation by sections, Itoupavazinha neighborhood.

INTERVENTION PRIORITY	WALKBILITY INDEX	STRETCHES
[illegible]	[illegible]	
Immediate Intervention	2,00 a 3,99	1 - 4 - 5 - 8 - 9 - 15
Short-term Intervention	4,00 a 5,99	2 - 3 - 6 - 7 - 10 - 12 - 13 - 14 - 16 - 17
[illegible]	[illegible]	11

Source: Priority criteria, SANTOS (2003), illustration elaborated by the authors 2020.

Thus, it can be concluded that the indices of walkability of the area recommend an intervention mostly in the short term, for 10 stretches, of the 17 analyzed. Although one stretch presents a satisfactory result, it is punctual and does not reflect the reality of the region, but it can become a stimulus to re-qualify the others, especially for the 6 stretches that need immediate intervention, as shown in figure 3.

7.3 Area 3 – Garcia neighborhood

Area 3 corresponds to the partial analysis of Amazonas Street, approximately 1.6km long, and presented a very satisfactory result, with an average walkability index of 6.76 points, higher in relation to the other two previous areas. This result is reflected in the maximum scores in numerous variables analyzed.

Some variables stand out with very satisfactory scores, three in particular presented maximum scores in all stretches, such as the presence of road and location signs, the predominantly flat topography, and the sidewalks with no barriers for displacement. In addition, it is worth noting that visual attractiveness, accessibility, and quality in public lighting, items that until now had not been mentioned with relevance in the previous areas, received good scores and stood out among the results. As well as issues of diversified land use, block sizes of less than 100 meters, quality in the type of sidewalk paving, and ease of access to public transportation contributed to the increase in the walkability index.

This analysis leads to the initial reflection on the theme of this research, that is, the relationship between walkability, topography, accessibility, and attractiveness of urban space. In this sense, a satisfactory result can be seen in the walkability index associated with these variables.

The accessibility of the sidewalks, the predominantly flat relief, and the attractiveness of the space (whether visual, with pleasant neighboring spaces, with squares, gardens, numerous stores and stores along the road, but also with a diversified use of the soil promoting even more the displacement on foot, Gehl (2015) and Jacobs (2011) emphasize that active facades, the prioritization of the human scale, a more connected urban design, and the diversity of uses and typologies ensure the necessary dynamism for the constant circulation of pedestrians. Thus, it can be initially concluded that the result converges to an effective relationship between the quality of walkability and these variables.

The stretches 23, 27 and 28 were the only ones from the total of 28 that presented results with the need for short-term intervention, with indexes of 5.88, 5.88 and 5.63, respectively. The variables that contributed to the reduction of these indexes were the absence of urban furniture, insecurity when crossing the street, no crosswalks and traffic lights, and no trees on the sidewalks. Through figure 4 we can observe the situation of walkability in the stretches of the region.

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Figure 4 – Walkability situation by sections, Garcia neighborhood.

INTERVENTION PRIORITY	WALKBILITY INDEX	STRETCHES
Critical Situation	0,00 a 1,99	
Immediate Intervention	2,00 a 3,99	
Short-term Intervention	4,00 a 5,99	23 - 27 - 28
Improvement and Refinement	6,00 a 10,00	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20 - 21 - 22 - 24 - 25 - 26

Source: Priority criteria, SANTOS (2003), illustration elaborated by the authors 2020.

Through this result it can be concluded that the area presents a great situation for walkability, requiring only improvements and refinements in some variables. Even the stretches that need short-term interventions are actions that can easily be solved.

Still in this context, associating the research on the profile of the walker and its implications for walking, it is expected to correlate this result with one of the hypotheses of this research, which suggests variables such as attractiveness and connectivity points, such as squares and spaces for pedestrians, along with a greater diversity of use of the urban space with various stores and services and how these contribute to the stimulation of walking in short distances.

7.4 Area 4 – Vila Nova neighborhood

Area 4 comprises a 1.55km extension of Almirante Barroso street, and presents an average walkability index of 6.66 points, slightly lower than the one found in area 3 (Garcia

neighborhood), but still considered satisfactory, requiring only improvements and refinements. This index reflects a series of favorable scores in the variables analyzed.

The variables that stand out with the best scores in most stretches are sidewalks free of barriers and obstacles, with firm, non-slip and accessible paving. Road and location signs, adequate public lighting, blocks smaller than 100 meters, and visual attractiveness and mixed land use also contributed to the satisfactory result in the region.

Another factor not yet mentioned with relevance in the previous areas was the cleanliness of the sidewalks, which received top scores in almost all sections, in addition to the predominantly flat topography.

It is worth mentioning that sections 9 and 11 were classified as a priority for intervention in the short term, due to lower scores for lack of protection against the weather, lack of afforestation, and insecurity when crossing the road. What draws attention is that section 9, on the left side, is a square in good conditions of use, recently rehabilitated. Figure 5 shows the situation of walkability in the stretches of the region.

Figure 5 – Walkability situation by sections, Vila Nova neighborhood.

INTERVENTION PRIORITY	WALKBILITY INDEX	STRETCHES
Critical Situation	0,00 a 1,99	
Immediate Intervention	2,00 a 3,99	
Short-term Intervention	4,00 a 5,99	9 - 11 - 17 - 18
Improvement and Refinement	6,00 a 10,00	1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 10 - 12 - 13 - 14 - 15 - 16

Source: Priority criteria, SANTOS (2003), illustration elaborated by the authors 2020.

And the sections 17 and 18 also need short-term interventions, but due to the fact that they present blocks larger than 100 meters, a non-diversified land use, and low visual attractiveness, mainly because it is an area with many urban voids[1]

Based on the results of the indices of walkability, it can be concluded that the region of area 4 presents satisfactory conditions for walking, considering the average of the indices. Thus, as in area 3 (Garcia neighborhood), determining factors in this result are related to the variables of accessibility, relief and attractiveness, in addition to the quality of sidewalks, especially in terms of leveling, paving and comfort conditions such as width dimension.

After the results of the indices of walkability of the four areas analyzed, it is possible to verify an improvement in the quality of urban space for the displacement of people in areas 3 and 4, associated with comfort conditions, such as sidewalks in good paving conditions and dimensions, safety in crossings, and the presence of accessibility criteria. Another preponderant factor was the attractiveness, either visual or in terms of the diversity of businesses and services in the neighborhood. On the other hand, areas 1 and 2 presented the lowest scores in these same variables, and consequently unsatisfactory results for walkability.

7.4.1 Profile of the walker

Através da pesquisa quanti-qualitativa, realizada por entrevistas foi possível conhecer o perfil do caminhante, que é predominantemente feminino, com idades variadas desde os 17 até os mais de 60 anos, com rendas menores nos bairros Itoupava Central e Itoupavazinha, e rendas maiores nos bairros Garcia e Vila Nova, sendo que consideram o carro como seu principal meio de transporte, principalmente para deslocamentos em grandes distâncias e para fora do bairro onde residem, enquanto que para curtas distâncias, dentro do bairro, utilizam a caminhada, principalmente com o objetivo de pagar contas, fazer compras, trabalhar, passear e praticar atividade física, considerando um tempo médio na caminhada entre 10 a 30 minutos.

Through the quanti-qualitative research, carried out by interviews it was possible to know the profile of the walker, who is predominantly female, with ages ranging from 17 to over 60 years old, with lower incomes in the Itoupava Central and Itoupavazinha neighborhoods, and higher incomes in the Garcia and Vila Nova neighborhoods, and who consider the car as their main means of transportation, They consider the car as their main means of transportation, mainly for long distances out of the neighborhood where they live, while for short distances, within the neighborhood, they use walking, mainly to pay bills, go shopping, work, walk and practice physical activity, considering an average walking time between 10 and 30 minutes.

8 FINAL CONSIDERATIONS

1 Urban vacant land is considered to be land located in areas provided with infrastructure that does not fully perform its social and economic function, either because it is occupied by a structure with no use or activity, or because it is in fact unoccupied, empty (BORDE, 2006, p. 8).

Walkability becomes the bias of the urban mobility process that prioritizes the smallest movement, making it of utmost importance for the city's urban planning process; it is through it that people have the opportunity to become protagonists in the cities again. In view of this understanding, this research sought to reflect upon and understand the role of walkability, as well as that of the walker in this process, in the city of Blumenau/SC.

The research sought to evaluate walkability and its relationship with accessibility and attractiveness in the urban space of some regions of the city of Blumenau, and it is safe to say that there is an intrinsic relationship between walkability and these variables.

In this sense, it was possible to evaluate the walkability in the selected areas, through the evaluation method proposed by Zabot (2013). In this way, each existing stretch between the intersections of the main and secondary roads were analyzed and received scores, and the neighborhoods Garcia and Vila Nova obtained the best indexes, with 6.76 and 6.66, respectively, classified so as to receive improvements and enhancements, to the detriment of the neighborhoods Itoupava Central with 3.96 and Itoupavazinha with 4.48, requiring immediate and short-term interventions, especially in issues related to sidewalk infrastructure.

However, although the proposal of this study considers only the application of this methodology, without changing it, it is worth noting that during the research the need arose to review the distribution of scores for each variable, considering that some variables have a greater impact on the walker than others, as pointed out by Smith and Butcher (1997) showing that issues such as: diversity of land use, more connected urban design and sidewalk infrastructure have a strong influence on people's decision to walk. However, a deeper study is necessary to propose changes in the scores for each variable, so that the methodology does not become too subjective, and that it can be applied for its validation.

It was possible to know the profile of the walker and correlate it with the results of the indices of walkability, and it was concluded that there is clearly a direct relationship between the best indices of walkability and the opinion of walkers, regarding a diversity in land use, with more shops and useful services, as well as outdoor leisure spaces, added to adequate infrastructure. Issues like these become people attraction, as they democratize the urban space.

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