

Analysis of sidewalks and facades in a stretch of urban beach fringe

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ABSTRACT

Attractiveness to walkability is seen as one of the fundamental factors that contributes to walking on foot in cities. In assessing the quality of the anthropic environment, some methodologies for diagnosing walkability indices take this factor into account. The objective of the research is to analyze the interaction between people, sidewalks and facades in a stretch of urban beachfront, related to factors that attract the daily practice of walking. Taking as a case study the applicability of the walkability index in a beachfront sector in the city of Ilhéus, in the state of Bahia, specifically with regard to its "Attraction" category, and analyze the results obtained compared to other similar studies. In the methodology used in this study, of qualitative and quantitative evaluation, "Attraction" is a category evaluated through four indicators related to facades and uses of urban land. In addition to the walkability analysis, we sought to ascertain the influence that "active facades" and "complete streets" are capable of exercising on the visual interconnection between the activities inside the buildings and the sidewalk segments that confront them, which are fundamental in promoting urban life. Regarding the results obtained, the final calculation showed that the aforementioned category, with regard to pedestrians, proved to be deficient, possibly due to the fact that the interaction between facades and streets is still being planned, prioritizing the circulation of cars, to the detriment of the human scale of pedestrians and active urban mobility.

KEY WORDS: Walkability. Attractiveness. Active facades. Complete streets.

1. INTRODUCTION

In the Brazilian cities, according to the National Terrestrial Transport Association (ANTP, 2016), pedestrian movements represent approximately 41% within the transport infrastructure. Even if the pedestrians do not walk along the entire path on foot, it is this way that they do it on a daily basis starting or completing their urban movements, although only for accessing motorized transport, either public or private. Though being a specific detail that is expected from the behavior of their movement, in several situations it is ascertained that the urban infrastructure is not qualitatively adequate for such purpose. It should also be noted that walking, running or just staying in the streets temporarily, are the only opportunities for lots of people to do physical activities. Another important observation is that stretches in urban beachfronts are naturally devoted to walkability activities, while being used as venues for leisure and sports, as well as for various sports modalities. This leads to the conclusion that providing attractive spaces also translates into an incentive to replace the use of motorized modes with movements on foot, besides the promotion of healthy habits.

From the second half of the 20th century onward, with a higher demand for the use of automobiles for urban movements, there was consequently need for expanding the road systems to meet the requirements of motorized traffic, especially individual traffic. The exponential growth of this type of movement, at that time, equally occurred in Brazilian cities. According to studies conducted in 2018 by the Institute for Transportation and Development Policy (ITDP Brasil), such process happened without the consent of the active transport modes. This same reality is found in the city of Ilhéus, in the coastal area of Bahia (Figures 1 and 2), just like what happens in other coastal cities. And, although having huge stretches of urban beachfronts, it is observed that they are not always attractive to walkability, as there are specific situations in which pedestrians are forced to compete with motorized vehicles for space in the streets or in public parking lots.

Figures 1 and 2: Satellite image and photo of Malhado Beach of the northern urban coastal area of Ilhéus



Source: Landsat / Copernicus, Maxar Technologies, U.S. Geological Survey, Google Maps and Pinterest

People of all age groups and in different perception, agility and locomotion capacity conditions – have a right to move, in their capacity as pedestrians. Therefore, people with or without disabilities, need routes that fully comply with universal accessibility requirements, seeing that they could suffer from permanent or temporary walkability constraints (ITDP, 2018). Walkability is then the study of this transport mode and its interrelation with the environment, either natural or built. In the present research, whose focus is walkability “attraction”, or attractiveness that favors it, it is of fundamental importance to specifically address two of its potentiating attributes, active facades and complete streets, concepts derived from the urbanization of contemporary cities.

This attraction referred to by the research work occurs just like the attractiveness exerted by cities, in which public and private spaces are interconnected, in a combination of factors in which pedestrians feel stimulated to walk. And they will do it along the lanes and sidewalks, favoring social interactions, making movements on foot possible in a leisurely manner, providing leisure and physical exercises, in other words, leading to active pedestrian mobility. This is what we call attraction derived from the urban environment, either favorable or unfavorable to walkability, later on studied and analyzed in this paper.

The idea is to demonstrate the possible causes (and consequences) of the low number of pedestrians walking and doing exercises in this urban space, in spite of commonly occurring on a larger scale in other similar urban situations. To this end, the results achieved will be analyzed, in comparison to other similar studies, in which this same walkability index was applied. It is also expected to contribute with occasional suggestions of possible mitigating urban interventions (and even with the methodological improvement of correlate future walkability studies), in medium-sized coastal cities.

The aim of the research consists in analyzing the interaction between people, sidewalks and facades in a stretch of an urban beachfront, related to factors that attract daily walkability initiatives. Besides trying to understand how these aspects are interconnected and have an influence on major or minor attractiveness to the walking habit of local people and visitors (tourists). The evaluation method that was adopted is through a tool known as iCam 2.2 (2019 version 2019) from the ITDP, specifically regarding its “Attraction” category, and its four indicators, through the application of the metrics of this walkability index, in a street tract of the beachfront in Ilhéus, tourist city located in the south of the state of Bahia. The aforementioned category is one of the six that are part of this walkability diagnosis methodology, split into 15 indicators, including the previously cited.

2. WALKABILITY – the attractiveness attribute

The guiding theme of this study consists in the empirical analysis of the interaction between sidewalks and facades in a stretch of the urban beach fringe, related to attracting factors – or to the attractiveness attribute – of the daily walkability habit.

Attraction, referred to by this research, occurs on a par with the attractiveness exerted by the cities, in which public spaces interconnect with private spaces, in a combination of factors where pedestrians feel stimulated to walk. And they will do it along the lanes and sidewalks, favoring social interactions, making movements on foot possible and pleasurable, providing leisure and physical exercises, that is to say, leading to active mobility on foot. This is the attraction derived from the urban environment, either favorable or unfavorable to walkability, which will be studied and analyzed in this paper.

This research, therefore, will undertake the responsibility for trying to understand how these aspects are interconnected and have an influence on major or minor attractiveness to the walking habit of local people and visitors. The evaluation method that was adopted is through the aforementioned tool known as iCam 2.2 from the ITDP Brazil, specifically regarding its “Attraction” category, and its four indicators, through the application of the metrics of this walkability index, in a street tract of the beach fringe in the south of the state of Bahia. The aforementioned category is one of the six that are part of this walkability diagnosis methodology, split into 15 indicators, including the previously cited.

2.1. Theoretical foundation

Southworth (2005), conceptualizes walkability as the measure that defines to what extent the built environment supports and encourages the activity of walking, providing comfort and safety to pedestrians. He also explains that it acts connecting an array of people and destinations, within a reasonable period of time and effort, provided it is endowed with an attractive visual. On the other hand, McKinney (2014) clarifies that walkability represents the quality of a certain space for walking. Still according to Southworth (2005), and Schlindwein (2017), the factors that make a city walkable include street connectivity, interaction with other transport modes, mixed-use of the ground, security and walking environment. Pitilin *et al* (2018) stress that walkability safety turns into an important instrument for evaluating the attractiveness exerted by the environment on pedestrians. Besides the aforementioned instruments, several studies and other variables were researched and raised, in a variety of areas of human knowledge, in an attempt to explain what walkability really is.

According to Nyagah (2015) these variables can be classified as subjective when they reflect the experience of the pedestrian, and objective when they represent the infrastructure or data collected in the field of action. Nevertheless, Pitilin *et al.* (2018) report that, in several studies on this theme, the approaches involve objective measures (indices), validation of existing models, people’s perception on local walkability and the improvement of a venue.

Other authors like Villeneuve *et al.* (2017) and Schofield *et al.* (2018) have studied the relationship between built environment, vegetation availability and correlation with the walk, and as a result, the improvement of health conditions and the reduction of air pollutant emissions. Such studies suggest that active urban ecosystems, that is to say, places covered with vegetation and infrastructures are associated with stimulus to walkability and cycling (bicycle commuting) as opposed to reducing car dependency, as a fundamental option.

Walking, according to Stein (2020, p. 2), translates into manners,

[...] most responsible for traveling from an environmental point of view, without considering its inherent limitations, as the distance covered and people's physical conditions. The study of this transport mode and its correlation with the environment is referred to as walkability.

In times of pandemic and afterwards, once the new normal conditions have been re-established, more than ever the social distancing culture will be necessary, and it certainly encourages walkability as an individual locomotion mode. For this reason and given its relevance, this case study was proposed, in an attempt to attest to the potentiality of altering active facades and complete streets in a stretch of the urban beachfront.

This is a universal theme and, provided its local characteristics are respected, it is believed that it could be applied to other coastal cities, based on the importance that the walkability subject will have on the post-pandemic planet. Authors like Gehl (2015) and Speck (2017), assumed the responsibility to debate urban mobility, in particular the walkability mode, and cities devoted to people, taking into consideration the "human scale/dimension as a universal starting point". On the other hand, Lerner (2011) refers to the fundamental importance of "boosting his self-esteem", his main urban initiative in Curitiba/PR.

Articles and publications attest that active facades have a positive influence on urban people's decisions to take walking tours, but no conclusive studies have been done so far on the potentiating power of the sum of these complete streets, especially in urban coastal fringes, object of this research. Walkability is the most ecological urban movement mode, as it does not generate any type of pollution, besides being healthy and beneficial. It favors social connection, and makes it possible for people to interact with the urban scenery, which leads to a major citizen share within the social context in which people live.

According to (2015, p. 148):

Keeping an eye on life in a city is one of the most important urban attractions. Seeing other people is a universal activity which occurs constantly when we walk, stop or sit down [...] The vision of other attractions like water, trees, flowers, water sources and architecture should also be an integral part of urban people's considerations. This vision is even better if several visions can be combined.

The aim of this research is to evaluate a stretch of urban beachfront in accordance with the methodology of the walkability index (iCam version 2.2 of 2019) from the ITDP, besides conducting research into other similar studies contained in scientific literature, with the intention to contextualize the results achieved in other localities in the country. The main purpose consists in understanding if the iCam 2.2 is capable of encompassing the majority of the singularities of the region herein analyzed and, consequently, reflect in a satisfactory manner the level of attraction/attractiveness exerted by walkability, observed in the field.

The justification is that the literature that has approached the subject, frequently correlates active facades and walkability, however, it does little about complete streets and walkability, and, much less about both of them – complete streets and active facades– and walkability.

2.2. Brief situational conceptualization of the attractiveness attribute between facades and sidewalks

Complete streets (from the original North-American concept), coexistence streets or *Woonerfs* (Dutch concept that means living street), their design is by principle focused on the human beings and the highest level of security for pedestrian and cyclists. The “*woonerven*” have inspired cities around the world, since the final years of the past century, initially in countries like Holland (with more than 6,000 woonerf zones, in their surroundings where about 2 million people live), in Wales and Britain (70 of such these zones have already been established, locally referred to as “domestic zones”) and in more than 400 cities in the United States with their complete streets.

Complete streets give origin to a series of urban cooling generators, creating a favorable micro climate and very attractive to walkability, such as: mitigation of the damaging effects coming from rainwater, biodiversity (canopy shade trees along sidewalks), air quality, a sense of space (amplitude), attractive street trading, small plazas, and energy savings in buildings (generating prime areas).

For a street to be considered complete it must have some attributes, such as: active sidewalks, bike lanes, active streets and safe crossings, and, planting strips and green areas. What follows is an explanation of these items:

- a) Active sidewalks – they need to be soft, wide, impart safety, and have appropriate transitions to the streets making it easier for walkers or wheelchair users;
- b) Bike lanes – besides being simple pavement markings, they need to create bicycle oriented spaces (bike lanes, bike paths or bike routes) making predictability possible between vehicles and cyclists and, therefore, becoming safer for both, drivers and cyclists, thus increasing the chances for casual drivers to shift to bicycles as a means of individual transport – a trend very likely for the “post normal” pandemic;
- c) Active streets –they can have, in specific cases, a central vehicle lane, between opposite lanes, which will be used for “*TWLTL*” (“*two-way-left-turn-lane*”), generating a reduction in the amount of accidents in the streets through the creation of this traffic refuge that will result into more efficient traffic flow;
- d) Safe crossings – with clearly demarcated lanes that allow pedestrians and wheelchair users to cross the streets safely, because they know exactly what to expect from the vehicle drivers;
- e) Planting strip – it consists of seedbeds along the sidewalk curbs where appropriate trees are planted to adorn the area and provide shade, serving as shock absorbers between motorized vehicles and people, inviting them to develop the practice of walking;
- f) Green spaces – they include parks, plazas, mini-squares or even small public green spaces whose purpose is to create destination and encourage community interaction providing for moments of relax and leisure amid the chaos of the urban environment.

EMBARQ Brazil in its Manual for Sustainable Transportation-Oriented Development (DOTS®) proposed an integral urban design conception of seven elements in areas with different uses and functions. As of 2015, EMBARQ came to be known as WRI (*World Resources Institute*) – Brazil Sustainable Cities, becoming part of a global research institution with operations in upwards of 50 countries. The seven elements are as follows: quality public transport, non-motorized mobility, mixed use and efficient buildings, active district centers and active ground floors, public spaces and natural resources, participation and community identity. Among the

various strategies preconized by the WRI it is worth mentioning the inter-district strategies, pedestrian and bicycle networks; for the district, internal connectivity and active ground-floors; for the street, sidewalks and bicycle lanes, pedestrian-street integration and friendly coexistence in the streets.

Furthermore, we must also consider traffic calming techniques, also known as “*traffic calming*”, a suggestion by WRI Cidades in *Cities Safer by Design*. These are guidelines and examples of how to promote traffic safety based on urban design, once, creating safer cities when there is the presence of cars, means to balance the tension inherent between the speed of the vehicles and the safety of pedestrians, cyclists and motor vehicle occupants (DUMBAUGH e LI, 2010). Reducing speeds of motor vehicles could facilitate the existence of share-use paths with pedestrians, cyclists, squares and mini plazas, wider sidewalks and bike lanes. This reduction could be implemented, for example, through the implementation of such traffic calming elements as speed bumps, speed cushions, chicanes, traffic bottlenecks and curb extensions. Other alternatives include: the replacement of parking spaces with “*parklets*” (temporary structures that provide more space and amenity for people), overpasses for pedestrians, roundabouts and mini roundabouts, electronic speed limit signs and fixed speed cameras (commonly known as sparrows), among others.

Of the 8 ITDP principles, walk, cycle, connect, public transport, mix, densify, compact, change – inspired by the DOTS model (Sustainable Transport-Oriented Development) from UN Habitat, the one that most applies to the present study is the first principle. To walk is to create neighborhoods that stimulate city dwellers to walk, according to the ITDP, and the three essential factors for a more pleasant trip are as follows: safety, activity and comfort, besides short distances and direct routes. For this to be accomplished, it is recommended to seek three objectives: safe and complete pedestrian networks, environments for vibrant and thrilling pedestrians, and mild and comfortable temperature. For these objectives to be achieved it is necessary for the urban design to have visually active and physically permeable facades, and provide shade and shelter. An active facade (visually) or “*PLINTH*” – in Dutch “*Plint*” means baseboard, but it can also mean the ground floor of a building, according to Karszenberg (2015) – is defined as an extension of the side of a building facing a public way along the sidewalk segments which are “visually penetrated” by the eyes of the pedestrians, through their vents (windows, shop windows and partially or completely transparent walls). On the other hand, the physically permeable facade refers to entrances, accesses and passages in these same buildings along the entire extension of these public sidewalks. Finally, the shaded sidewalk is the one capable of providing the pedestrians with shade and shelter from heavy rain and direct sun, through urban afforestation, horizontal and vertical protective bulkheads of the buildings.

As cited by the GDF (2017), the priority of urban planning and design of a living, safe, sustainable and healthy city should be the people (GEHL, 2015), because they are the ones in a position “to contribute with instruments and strategies to good experiences”. The public spaces perform a fundamental role, of the sidewalk segments, going through plazas and arriving at urban squares. It is the people who, by seizing these public spaces, either as a necessity or option, make the urban scenario lively and safe, with more pedestrian circulation and more cyclists, and as a result, fewer motor vehicles. The quality of these spaces determine the

activities performed in them, like, for example, the frequency of people walking from one place to another. In this appropriation, active facades perform a fundamental role.

Different studies have addressed a big number of urban instruments and strategies. Among them, much has been written about active facades, to the extent that they have already been incorporated in the urban tissue of some Brazilian cities, for example, Brasília, São Paulo and Belo Horizonte, becoming an integral part of their public policies. Their contribution to daytime movements on foot is of fundamental importance, making the cities safer, more sustainable and healthier. Facades with higher physical and visual permeability, at sidewalk level, contribute towards making the cities safer. By promoting the natural “Street eye” vigilance (JACOBS, 2011), they equally contribute to improved public space, making it more interesting for the pedestrians and, thus favoring the movements on foot and by bicycle.

Attractive facades marked by diversity – with variations in textures, materials, colors, volumetrics, vents, among other architectural elements – attract pedestrian attention, avoiding the monotony of the movements, letting them enjoy the walkability experiences, thus contributing towards the relationship between public/private space. The free access and circulation, without obstacles, from the building to the public patio and vice versa, is also directly responsible for holding the pedestrian in high esteem. Therefore, walls and railings between active facades and sidewalk segments should be avoided, seeing that they interfere negatively, interrupting the transition between public elements (sidewalks, plazas and squares) and private elements (buildings).

If the facades consist of closed level surfaces, without openings, for a variety of reasons, including internal private security, the exact opposite occurs to people who walk across public spaces: the route of the pedestrian turns out to be little attractive and, frequently, unsafe. Similar effect is also caused by alterations in the sidewalk pavements (unevenness and different pavements, forming real “crazy quilts”), landscape elements, movables, lighting, and other urban “obstacles”. Furthermore, staircases or garage access ramps end up delimiting the public spaces and the transition zones, interrupting pedestrian experience (GDF, 2017, p.18-19).

3. METHOD – walkability index calculation by ITDP (iCam 2.2)

The iCam 2.2 methodology, according to the ITDP, used in this research, has as base unit the sidewalk segment, located between adjacent street crossings, on just one of its sides. And this applies both to data collection and the evaluation of the indicators, categories and the walkability index calculation, at the end.

The method adopted for evaluating the walkability index checks the most relevant conditions – the aforementioned indicators – in each segment of the sidewalk separately, starting from six categories – sidewalk, mobility, attraction, road safety, public safety and the environment. These segments are given a qualitative assessment mark, through a quantitative field survey, following pre-established metrics: insufficient (0), sufficient (1), good (2), and excellent (3). Through weighted average calculations we go to decimal digits for each of the 15 indicators, after this, to their 6 categories, and, finally, to the total walkability index of the analyzed urban area.

The Attraction category, target of this study, has four indicators: physically permeable and visually active facades, and, public day/night uses and mixed ones. These are indicators that characterize the use of urban soil attractive to pedestrians, evaluation of the characteristics of built space and the frequency its routes are used.

3.1 Study area

The walkability assessment methodology iCam 2.2 was applied on a stretch of the seafront located north of the city of Ilhéus, in the municipality of the same name, on the south coast of the State of Bahia. The population of the municipality is approximately 165,000 inhabitants (IBGE, 2018) and the estimated area reaches 1,585 km², split into 11 districts. One of its most marking characteristics is that it possesses the longest coastline in the state, coming only after the coastline of the capital city Salvador. Ilhéus is a city with a lot of historical constructions because it used to be a hereditary captaincy, whose seat was Vila de São Jorge dos Ilhéus, origin to its current name, when it officially became a city in 1881. More recently, it was the largest export terminal during the Golden era of cocoa bean.

The area that is the object of this study, was selected through a specific territorial cutting with the aim to bring the present analysis to the street scale, or of a set of streets, avenues and respective blocks. It was delimited in the perimeter comprised by Travessas Cometa I, II and III, Ipanema street, and Avenue Lindolfo Collor de Melo, North Seafront and Antônio Carlos Magalhães, besides from the sidewalk or internal sidewalk to the existing Square, which limits itself to Malhado Beach (Figure 3). The *in loco* visits, for the collection of data and georeferenced photographic records occurred during the months of September and October 2019.

The city of Ilhéus was one of the first to have a master plan in Brazil (1933) and the urban document in force dates back to 9 October 2015. It should also be mentioned that the aforementioned study area recently went through significant urban requalification with the renewal of the asphalt pavement and road traffic reorganization, through the implementation of new horizontal and vertical signs, pedestrian crossings, bike lanes and bus lanes. However, the same does not hold true for the segment of sidewalks, as they were left with no maintenance work, improvement or repavement, thus representing a missed opportunity for standardizing and requalifying them. Including the adoption of tactile floors and the elimination of obstacles, including urban movables, and improperly positioned road signs.

Figure 3: Location of the urban beach fringe studied



Source: Author, 2019

3.2. Physically permeable and visually active facades

The assessment of physically permeable facades involves the attractive accesses for internal pedestrian entrance, such as openings on the front side of the shops, restaurants and park entrances and cafeterias, and building maintenance services. Nevertheless, the following are disregarded: emergency exits, accesses to depots, and entrance of vehicles into buildings, except when used by pedestrians.

On the other hand, the evaluation of the physically active facades refers to the constructive elements that permit the visual connection of the pedestrians with the internal activities of the buildings – between the ground floors and the floors immediately above. These are door and window frames and partially sealed or completely transparent, for example shop windows, besides open spaces for the entrance of pedestrians. Other items included in this estimate include curtains or Venetian blinds, either internal or external venetian blinds, provided they are actionable: frontal retreats with spaces for public use (accountable in their total extension); and vehicle accesses. However, closed garden and veranda areas are not counted as visually active elements.

In streets with a width of 10 meters or less (in the shortest distance among the tested streets in frontal plots) – the active facades of the two opposing sides of sidewalk segments contribute in a complementary way, allowing, the sum of the extension of their visual connection elements with the internal activities of the buildings.

3.3. Public day/night uses and mixed uses

With regard to the evaluation of the public day and night use, public use comprises the public use activities, whether in public areas, or in private areas, which increase the frequency of the occupation of public spaces. And this occurs due to the attractiveness of the environment for their complementary uses and activities, allowing the pedestrians to their activities in different day and night periods.

This indicator takes into account all the buildings built for public use and all the floors of the surrounding buildings to the sidewalk segment. Even in situations in which the use and access to the public are controlled, through a reception desk, for example, the buildings can only be considered provided pedestrian circulation is visualized during the *in situ* survey. The same holds true for the observation of public areas with unrestrained accessibility like parks and plazas.

The scoring criteria for this indicator demand the mandatory obligation of the existence of at least one public nocturnal use at each 100-meter segment of the sidewalk, given its relevance at nighttime walkability and its influence on the perception of public security, especially for the female gender. In turn, the evaluation of mixed uses, is the balanced use of uses and activities, which occurs in the adjustment of an urban environment to pedestrians, where movement and distance needs to be covered are equated, thus decisively contributing towards the attractiveness of public spaces by day and by night.

There are four use categories listed in this indicator – residential; commercial and services; public equipment, institutional or transport stations; and, industrial and logistic. Its survey ascertained the predominant use in each floor of the buildings with pedestrian accesses in the segments of the analyzed sidewalks.

For the score of the mixed uses indicator not to be considered insufficient, it is mandatory to comply with at least two of these requisites: the residential use should be bigger or equal to 15% of the total number of floors for each block-face, this use could be inferior to 15%, provided there are 3 or more buildings with public night use for every 100; the said square face should have at least 50% of its length with plots or buildings without use.

Picture 1: Parameters of the category Attraction indicators

Indicator	Metrics	3 (Excellent)	2 to 2.9 (Good)	1 to 1.9 (Sufficient)	0 to 0.9 (Insufficient)
Physically permeable facades	Average number of entries and accesses of pedestrians at every 100 m of the block-face	≥ 5	≥ 3	≥ 1	< 1 entrance
Visually active facades	% of the block-face size with visual connection with the activities in the interior of the buildings	≥ 60%	≥ 40%	≥ 20%	< 20% of the extension
Public use by day and by night	Average number of buildings and public areas with public use by day and by night at every 100 meters of the block-face length	≥ 3	≥ 2	≥ 1	< 1 Building
Mixed uses	% of the total number of floors with predominant use in the buildings opposite to the sidewalk segment	≤ 50%	≤ 70%	≤ 85%	> 50% of the total number of floors

Source: Author, 2019

4. RESULTS, DEBATES AND CONTRIBUTIONS

At the literature survey, several authors were detected and they utilized the iCam methodology of the ITDP in their studies, as can be observed at Picture 2. It is clear that in the 13 studies analyzed the category Attraction received scores from 0.5 to 1.9 (in FEPESE the intermediate value would be 1.5), therefore the arithmetic hypothetical average would be 1.3.

Picture 2: Studies with the application of the ITDP method

Titles	Location	Study area	Nº of segments	Attraction
ITDP (2017)	Santo Cristo, Rio de Janeiro	Port area	X	0.5
ITDP (2016)	Pça Tiradentes, Rio de Janeiro	Central	153 (28 streets)	1.2
Oliveira <i>et al.</i> (2019)	Mossoró / RN	Central	X	1.2
FEPESE (2018)	Videira / Santa Cruz do Sul	X	22	0.0 to 3.0
Rufino <i>et al.</i> (2019)	Monte Carmelo / MG	Central	X	1,8
Serpa <i>et al.</i> (2019)	Petrópolis / RJ	Central	19 (3 plazas)	1,8
Brandão <i>et al.</i> (2018)	Ouro Preto / MG	Historical Center	8	1,8
Pfützenreuter and Oliveira (2018)	Balneário Barra do Sul / SC	Central + beach	8	1,9
Tonon <i>et al.</i> (2018)	Marília / SP	Central	14 blocks	X
Lazarin (2018)	Cascavel / PR	Central	16	1,8
Ramos (2019)	Vila Velha / ES	Central + beach	23	1,5
Zorek and Pisani (2018)	Av. Paulista, São Paulo / SP	Non central	9	1,5
	Praia Grande / SP	X	6	1,7
(X) not specified in the study				

Source: Author, 2019

For the present research, 17 sidewalk segments were analyzed through the iCam 2.2 methodology (including the internal sidewalk of the Litorânea Norte Park Av., in six blocks and in six adjacent public parks (3 alleys, 1 street and 3 avenues). Therefore, the sidewalk segments that run parallel to the beach were chosen jointly with the alley, street and avenue segments that run perpendicular to them, in the nearest blocks.

In this study, the indices relative to facades, the previously cited “*plinths*”, in the physically permeable (Figure 5) a 0.6 score was achieved, considered through the iCam 2.2 methodology as insufficient, and exactly the same happened in the visually active (Figure 6). With regard to the physically active facades, it was ascertained that only the sidewalk segments

of Avenue Litorânea Norte (at block 26) and on the corner of the latter and Avenue Lindolfo Collor (at block 30) the on-field scores were not 0, but respectively 1 (sufficient) and 2 (good). Things are identical with regard to the index of the visually active facades, where most of the scores are 0, and only three others have a 1 and 2 score, never achieving score 3 (excellent). In both situations what probably occurs is that the buildings, although most of them face the park and the beach, in case of residential buildings, they have recessed ground floors and their “plinths” are replaced with walls and gates, obstacles to physical and visual accessibility. The results per segment and the scores of both indices can be visualized numerically and graphically (in the captions) in Figure 4.

Figure4: Results per indicator and category

Endereço	Quadra	Calçada (metros)	FACHADAS FÍSICAMENTE PERMEÁVEIS		PI	FACHADAS VISUALMENTE ATIVAS		PI	USO PÚBLICO DIURNO E NOTURNO		PI	USOS MISTOS		PI	ATRAÇÃO		Ci	Nota Pontuação	Definição	Legenda
			Legenda	Legenda		Legenda	Legenda		Legenda	Legenda		Legenda	Legenda							
Avenida Litorânea Norte	6	76,0	0	0,0	0,0	0	0,0	0,0	1	2,3	0	0,0	0,3	0,0	0,3	0,6	0 (0,0 a 0,9)	Insuficiente		
Avenida Litorânea Norte	13	133,0	0	0,0	0	0,0	0	0,0	1	3,9	0	0,0	0,3	0,0	0,3	1,0	1 (1,0 a 1,9)	Suficiente		
Avenida Litorânea Norte	18	99,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0,0	0,0	0,0	2 (2,0 a 2,9)	Bom			
Avenida Litorânea Norte	26	205,0	1	6,1	1	6,1	2	12,2	1	6,1	1,3	5,8	1,0	5,8	2,6	3 (3,0)	Ótimo			
Avenida Litorânea Norte	30	197,0	1	5,8	1	5,8	1	5,8	1	5,8	1	5,8	1,0	5,8	2,6	3 (3,0)	Ótimo			
Avenida Litorânea Norte	Praia	785,0	2	46,5	2	46,5	1	23,3	0	0,0	1,3	29,1	0,0	1,3	29,1	3 (3,0)	Ótimo			
Avenida Antonio Carlos Magalhães	30	46,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0,0	0,0	0,0	0,0	0 (0,0 a 0,9)	Insuficiente		
Avenida Antonio Carlos Magalhães	378	371,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0,0	0,0	0,0	0,0	0 (0,0 a 0,9)	Insuficiente		
Avenida Lindolfo Collor de Mello	18	59,0	2	3,5	2	3,5	1	1,7	0	0,0	1,3	2,2	0,0	1,3	2,2	2 (2,0 a 2,9)	Bom			
Avenida Lindolfo Collor de Mello	26	59,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0,0	0,0	0,0	0,0	0 (0,0 a 0,9)	Insuficiente		
Travessa Cometa II	6	52,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0,0	0,0	0,0	0,0	0 (0,0 a 0,9)	Insuficiente		
Travessa Cometa III	6	50,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0,0	0,0	0,0	0,0	0 (0,0 a 0,9)	Insuficiente		
Travessa Cometa I	13	57,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0,0	0,0	0,0	0,0	0 (0,0 a 0,9)	Insuficiente		
Travessa Cometa II	13	55,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0,0	0,0	0,0	0,0	0 (0,0 a 0,9)	Insuficiente		
Travessa Cometa I	18	57,0	0	0,0	0	0,0	0	0,0	0	0,0	0	0,0	0,0	0,0	0,0	0,0	0 (0,0 a 0,9)	Insuficiente		
Rua Ipanema	30	45,0	0	0,0	0	0,0	0	0,0	1	0,0	1	1,3	0,3	1,3	0,3	0,3	0 (0,0 a 0,9)	Insuficiente		
Parque da Av. Litorânea Norte	Calçada interna	1.027,0	0	0,0	0	0,0	1	30,4	0	0,0	0,3	7,6	0,0	0,3	7,6	0,5	0 (0,0 a 0,9)	Insuficiente		

Source: Author, 2019

Figures 5 and 6: Litorânea Norte Av. and Lindolfo Collor de Melo Street (Block 18) – night and day view



Source: Author, 2019

The indices related to uses, in turn, regarding the day and night public (Figure 7), the score 0.8 was found (insufficient), while in the mixed uses (Figure 8), the score that was reached was 0.1, both considered as insufficient by the iCam 2.2. With regard to the by-day-and-by-night public use, just like what happens with the two previous indices, most of the scores are also 0, and some scores remain between 1 and 2, but with regard to the mixed uses index, all the scores are 0, with the exception of three scores 1. Once again the credit of the sufficient and good scores probably goes, in the first index, to the existence of small bars, restaurants and snack bars. And in the second, on the account of the existence of some small convenience stores (bakeries, grocery stores, beauty parlors, among others), mainly located along the same avenues of the two previous indices, which are the access routes to the districts. The result by segment and the score of both indices can also be visualized in Figure 4.

Figure 7 and 9: pathway across the Park and Av. Antonio Carlos Magalhães (block 378)



Source: Author, 2019

Having calculated each indicator separately, it is observed that the attraction category reaches a final score of 0.50, which again turns out to be insufficient. These results, in spite of the fact that the analyzed stretches had been requalified recently, they have not yet brought the improvement of the urban structure, the changes to the facades of the real estate and let alone to the diversification of their uses, as possible consequences. Furthermore, the said route requalification, is still a long way from configuring them as complete streets, mainly the three avenues - Lindolfo Collor de Melo, Litorânea Norte and Antônio Carlos Magalhães – which could be connected to the coastal park after its complete reurbanization. This is an interaction that is not duly treated by the iCam tool; only sidewalk segments near the building facades are considered for evaluation purposes, and not the ones existing in parks and public plazas, besides the absence of specific analyses of the so-called complete streets. The quantitative results per block are expressed in the aforementioned Figure 4.

iCam 2.2 turns out to be a comprehensive tool for the purpose of evaluation and urban quality diagnosis favorable to walkability and can be applied totally or partially (although the recommendation from the ITYDP is for the evaluation of up to one square kilometer), that is to say, at the pedestrian and district scale. The option was for the partial application of only one of the six categories –the Attraction category – as previously cited, because it was the most relevant for this study, and for the selected public of the urban stretch: residents, walking and sports practitioners in the Malhado Beach Park, by virtue of the recent route requalification process conducted in this location. An example of this relevance is the flow of pedestrians which is influenced by the Day and Night Public Use indicator, which basically depends on the time the commercial buildings operate and, the diversified use of constructed private space which has an influence on the Mixed Uses indicator. The latter is of paramount importance to promote social interactions that will result into an inclusive and living city.

5. FINAL CONSIDERATIONS

This study presents the analysis methodology and the results achieved in a stretch of urban beachfront in the city of Ilhéus and in other cities cited in the literature with regard to Attraction as a category of the Walkability Index – iCam in its most recent 2.2 version – developed by the ITDP (Institute for Transportation and Development Policy). The study's main contribution consists in clearly demonstrating that the infrastructure of urban transportation in this stretch, in spite of its requalification, is not sufficiently attractive to pedestrians, including in locations with a potential for attracting tourists and an innate vocation for sports activities. This largely happens on account of traffic construction and management, whereby priority is given to automobiles. This conclusion is evidenced in the results presented in Figure 4, of the

partial sidewalk segments analyzed in the four indicators – Physically Permeable Facades, Visually Active Facades, Day and Night Public Use and Mixed Uses – and total, in the Attraction category of the iCam 2.2 of the ITDP. If the results achieved in this study are compared to other results in literature it is perceived that attraction is in fact a complicating factor regarding urban design focused on the pedestrian. Fundamentally, in light of his eyes, within the human coexistence context, in different regions throughout the country, it is what penalizes him and exposes him to semi-confinement and social isolation.

As to this research, its main limitation, pointed to future studies and the application of other ambient quality calculation methods at the terrestrial scale of pedestrians or the comparison of results. Such situation occurs, seeing that currently the ITDP, through version 2.2 of the iCam methodology in force, presents only and uniquely four indicators pertaining to the Attraction aspect – or attractiveness to pedestrian activities. Such limitation explains, in part, the difficulty in addressing the totality of the walkability attractiveness factors pertinent to the pedestrian to the detriment of other urban movement manners. On account of the difficulty in properly calculating the stretch of the internal route of the park located between the beach and the Avenue with the considerable extension of approximately 1.027 m, it is recommended to carry out a revision of the methodology. The reason is the inclusion of this type of infrastructure, considering it as a sidewalk segment, although having no connection with a street and nor could it be considered a “pedestrian zone” (exception envisioned by the ITDP). Maybe it’s time to clarify that the length of this internal route was estimated through *Google Earth*, as it was not possible to find its original project, and it is not contained in the mapping survey existing in town. This readjustment would consider indices of walkability analyses of stretches of urban beachfronts where there are pathways for pedestrians between the beaches and sidewalks, and existing avenues, and even internal pathways in parks and public plazas. The other recommendation is for the creation of more indicators (or even a new category) – of complete streets – complementary to attraction.

Furthermore, as specific recommendation relative to the Attraction category (general recommendations are supposed to depend on a complete analysis of the iCam 2.2), resulting from the data crossing collected in the field of the four indicators, the priority interventions with immediate action, to the municipal administrators. This happens because at scoring, both of the category and indicators, all of them were considered “insufficient” (scores below 1). To this end, there is need for deeper studies, maybe with the total application of the iCam 2.2 in that area, with an eye on making an urban revitalization project possible, which could be interconnected with the Mobility Plan of Ilhéus, still at its initial elaboration stage. . It is recommended that the population and other local urban players lend their collaboration to this process, establishing a citizen coparticipation system, identifying demands, strategies, resources, whilst coming up with co-administration and monitoring mechanisms.

On the other hand, it should be stressed, in times of COVID-19 and afterwards, should the “new normal” be achieved, the social distancing culture will probably continue necessary, which will certainly stimulate walkability as a means of individual locomotion. It should also be reiterated that for this reason and given its relevance, the theme was proposed, with the Ilhéus case study, coastal city in South Bahia, in an attempt to demonstrate the potentiality of the conceptual combination of active facades and complete streets in a stretch of its urban beachfront. This is certainly a universal theme and, with due respect to the local characteristics,

it could be applied to coastal cities throughout the world, given the importance the walkability subject will have on the post-pandemic planet.

The current global situation of the pandemic, which affects everybody indistinctly, will require a continuous and continued global adaptation effort, besides much resilience in search of sustainable transport means, which will tend towards a certain individualized preference, and out of them all, walkability (practiced by pedestrians) and cyclability (practiced by cyclists) will more than likely tend to configure themselves as priorities. To this end, there is need for a political decision towards massive investment in infrastructure, subverting the current logics of the automobile.

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