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Evaluation of the spatial quality of the Largo São João of the Avaré Touristic Resort – SP

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Authors' notes'

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Abstract

Squares play an important role in cities, as they are places for social interaction and contact with nature. They constitute an important space for cultural, social, and political expression. They represent the customs and culture of a society. Studies on the evaluation of public spaces show that different aspects can contribute positively or negatively to the vitality of these places.

Objective: Assess the spatial quality of a public space and its immediate surroundings, considering different elements, which can positively or negatively impact the vitality of this place.

Methodology: Based on a multi-method approach, whose instrument was developed by Silva (2020), the evaluation is composed of three stages: i) performance indicators and the Plaza Quality Index (acronym in Portuguese - IQEP), ii) topoceptive analysis; and iii) systematic observation using a behavioral map.

Originality/Relevance: The use of complementary quantitative and qualitative techniques allows for a broader diagnosis of the public space, which supports the proposition of more assertive solutions to promote the vitality of this space.

Results: The results show that the public space is favorable for people to use and stay there, however, it needs some improvements in relation to aspects involving user safety. And, the presence of leisure equipment, for different age groups, can give greater vitality to the space.

Social / management contributions: Knowing the problems that negatively affect the use and vitality of a public space can support the proposal of design guidelines and activities to requalify this space.

Keywords: square, spatial quality, Largo São João

Avaliação da qualidade espacial do Largo São João da Estância Turística de Avaré - SP

Resumo

As praças têm um papel relevante nas cidades, pois são locais de convívio social e de contato com a natureza. Constituem em um importante espaço de expressão cultural, social e política.

Representam os costumes e a cultura de uma sociedade. Estudos sobre a avaliação de espaços públicos mostram que diversos aspectos podem contribuir positiva ou negativamente para a vitalidade destes lugares.

Objetivo: Avaliar a qualidade espacial de um espaço público e de seu entorno imediato, considerando diferentes elementos, que podem impactar positiva ou negativamente na vitalidade deste lugar.

Metodologia: A partir de uma abordagem multimétodos, cujo instrumento foi desenvolvido por Silva (2020), a avaliação é composta de três etapas: i) indicadores de desempenho e o Índice de Qualidade de Praças (IQEP), ii) análise topoceptiva; e iii) observação sistemática utilizando mapa comportamental.

Originalidade/Relevância: A utilização de técnicas quantitativas e qualitativas complementares, permite um diagnóstico mais amplo do espaço público, o que corrobora para a proposição de soluções mais assertivas para promover a vitalidade deste espaço.

Resultados: Os resultados mostram que o espaço público é favorável ao uso e permanência das pessoas no local, no entanto, necessita de algumas melhorias em relação aos aspectos que envolvem a segurança dos usuários. E, a presença de equipamentos de lazer, para diferentes faixas etárias, pode conferir maior vitalidade ao espaço.

Contribuições sociais / para a gestão: Conhecer os problemas que afetam negativamente no uso e vitalidade de um espaço público pode subsidiar a proposição de diretrizes projetuais e atividades para requalificar este espaço.

Palavras-chave: praça, qualidade espacial, Largo São João

Evaluación de la calidad espacial del Largo São João del Polo Turístico de Avaré - SP

Resumen

Las plazas desempeñan un papel importante en las ciudades, ya que son lugares de interacción social y contacto con la naturaleza. Constituyen un importante espacio de expresión

cultural, social y política. Representan las costumbres y la cultura de una sociedad. Los estudios sobre la evaluación de los espacios públicos muestran que diferentes aspectos pueden contribuir positiva o negativamente a la vitalidad de estos lugares.

Objetivo: Evaluar la calidad espacial de un espacio público y su entorno inmediato, considerando diferentes elementos, que pueden impactar positiva o negativamente en la vitalidad de este lugar.

Metodología: Utilizando un enfoque multimétodo, cuyo instrumento fue desarrollado por Silva (2020), la evaluación se compone de tres etapas: i) indicadores de desempeño y el Índice de Calidad Plaza (siglas en portugués - IQEP), ii) análisis topoceptivo; y iii) observación sistemática mediante un mapa de comportamiento.

Originalidad/Relevancia: El uso de técnicas cuantitativas y cualitativas complementarias permite un diagnóstico más amplio del espacio público, lo que sustenta la propuesta de soluciones más asertivas para promover la vitalidad de este espacio.

Resultados: Los resultados muestran que el espacio público es favorable para que las personas lo utilicen y permanezcan en él, sin embargo, necesita algunas mejoras en relación a aspectos que involucran la seguridad de los usuarios. Y, la presencia de equipamientos de ocio, para distintos grupos de edad, puede dar mayor vitalidad al espacio.

Aportes sociales/de gestión: Conocer los problemas que afectan negativamente el uso y vitalidad de un espacio público puede apoyar la propuesta de pautas de diseño y actividades para recalificar este espacio.

Palabras-clave: plaza, calidad espacial, Largo São João

Introduction

Public spaces play an important role in cities (Mehta, 2014; Praliya & Garg, 2019). They contribute to making cities healthier. They can assist residents in improving their health and well-

being, as well as enriching their social relationships and cultural life (Mehaffy, 2019).

Regardless of their size, different types of public spaces, such as squares, largos (in Portuguese), or urban parks, have the function of improving the livability, environmental quality, and sustainability of a neighborhood or city (Praliya & Garg, 2019).

These are areas that are open and accessible to all people (Paudel & Pant, 2023). Human history shows that these spaces were "the stage for social and cultural manifestations of a population" (Magagnin, 1999, p. 35) and milestones of political and economic events in a society (Magagnin, 1999; Gürer, Imren Güzel & Kavak, 2017).

The presence of public spaces in cities contributes to achieving some of the global goals of the New Urban Agenda and the UN Sustainable Development Goals, aiming to make cities more inclusive and safe, resilient and sustainable (United Nations, 2022, n.p.). Among the goals set by the UN for Goal 11, Sustainable Cities and Communities, in relation to public spaces, Goal 11.7 mentions that by 2030, "cities should provide universal access to safe, inclusive, accessible and green public spaces, particularly for women and children, older people and people with disabilities" (United Nations, 2022, n.p.).

Offering good quality public spaces encourages the use of space, increases social interaction and the practice of passive or active leisure activities, in addition to providing a healthier lifestyle to visitors (Mehaffy, 2019). They contribute to sustainability, as the vegetation present in this space can soften the heat, absorb noise, and provide moments of leisure through contact with nature (Maia, 2018).

The diversity of activities such as cultural events, the presence of circulation spaces, spaces for social activities (meetings), playgrounds, and physical activity contribute to increasing the use and vitality of this space (Benedet, 2008, p. 25).

According to Gehl (1987), the quality of a public space is associated with the presence of spaces for walking, standing still, sitting, seeing, listening and talking. As well as the presence of accessibility, attractiveness, comfort, vitality, and safety (Carmona, 2010).

Dall'igna Ecker (2020) lists other factors that can contribute to the spatial quality of a public space, such as a square, for example. For the author, the presence of buildings to limit the public space, the definition of clear circulation routes with connections that can favor accessibility and sociability, the presence of urban elements or urban furniture (benches and seats, tables, drinking fountains, water mirrors, fountains, works of art, stage or amphitheater, trash cans, among others), the presence of activities and landscaping (responsible for the formation of spaces, definition of the width of sidewalks, distribution of green areas, in addition to the homogeneity of landscaping) are elements that can contribute to the use of this space. Vegetation can interfere with public space, because in addition to promoting shading, it can demarcate axes and visuals, define framing and spatial connections, in addition to exercising the function of a physical barrier or windbreak.

However, the quality of the public space is not only associated with the activities present in this environment or in its dimension, but is also associated with the conditions of maintenance and management, so that this space can be used to its full potential, "ensuring the safety of use and its accessibility to all groups of users" (Alberti et al., 2019, p. 94), equally to all citizens, on all occasions (Carmona, 2019).

In order for municipal managers to identify and understand the main problems that negatively impact the quality of these public spaces, different methodological approaches have been used by researchers from different countries.

Jacobs (1993) evaluated the issues associated with the safety, diversity and vitality of city spaces, in particular the public sphere. Whyte (1980) analyzed the success or failure of public spaces by identifying the factors that can attract people to these places, such as places to sit, eat, as well as offer comfort, commercial activities. Another element identified by the author refers to the relationship of the main space with the flow of pedestrians and with external stimuli.

Gehl (1987) used systematic observation to evaluate public spaces through 12 criteria grouped into three main themes - protection, comfort and fun - which allowed the evaluation of

the quality of a good public space design. According to the author, spaces for walking, standing still, sitting, observing, listening, and talking to other people provide quality to a public environment.

Carmona (2010) identified criteria for a public space to offer quality to its users: cleanliness, organization, accessibility, attractiveness, comfort, inclusion, vitality and viability, function, distinction, safety and protection, robustness, absence of pollution, and capacity to carry out activities.

The international organization Project for Public Spaces (PPS, 2018) has developed an instrument to evaluate and propose improvements to public spaces that encompasses four major themes*: Access and Connections, Comfort and Image, Uses and Activities, and Sociability,* which group several indicators and make it possible to evaluate a successful public space globally.

De Angelis, Castro e De Angelis (2004) developed a methodology aimed at evaluating public squares from the perspective of the physical structure through the application of technical auditing and user opinion. The method is subdivided into four stages: i) quantitative survey of existing equipment and structures using an evaluation form; ii) qualitative analysis of the state of conservation of existing equipment and structures, evaluated by a form containing several parameters of analysis whose evaluation scale varies from 0.0 to 4.0 points; iii) qualitative and quantitative survey of vegetation and iv) application of a questionnaire to users. De Angelis et al. (2005) tested the method in 102 squares in Maringá-PR.

Costa (2008) used phenomenology to evaluate two neighborhood squares in the city of Ilhéus (BA). Through the use of participant observation techniques, interviews and mind maps, the author identified the significant elements of these squares that influence users in the use of this space and also allowed to identify whether or not they need to be revitalized. The results subsidized the elaboration of two proposals for spatial requalification based on the promotion of a construction or recovery of infrastructure (equipment), insertion or reconstruction of urban qualities (accessibility, centrality, symbolic or ecological), "to rescue and value the micro

ritualizations generated by the affective gratifications of each user towards these squares" (Costa, 2008, p. 117).

Silva (2020) proposed an instrument to assess the spatial quality of squares, based on the physical and morphological elements that make up four two-dimensional planes of the square and its immediate surroundings (square, sidewalk, street, and facade plans), which involve users in the public space. Based on the use of multi-methods, the instrument is comprised of four stages of evaluation: (i) analysis of the physical aspects of the two-dimensional plans that involve users (square, sidewalk, street and facade), by means of performance indicators and an index called the Spatial Quality Index of Squares (in Portuguese Índice de Qualidade de Praças - IQEP); (ii) analysis of the influence of shape, aspects and morphological elements of the square and its immediate surroundings related to spatial legibility (topoceptive performance); (iii) identification of the main uses, behaviors and activities based on observations (behavioral map); and, (iv) identification of the level of satisfaction of users in relation to the use of the space of the square and its surroundings. To validate the methodological proposal, the instrument was applied in the central squares of the cities of Tupã – SP and Paraguaçu Paulista – SP, small cities, with a large pedestrian flow, with different types of activities and objectives.

In summary, the methods presented allow the evaluation of the quality of public spaces using different approaches, including multi-methods. The adoption of different techniques or instruments to evaluate a single space makes it possible to understand the interference of the various elements that make up the public space and that interfere with its use and local attractiveness.

In this context, the contribution of this article is related to the application of part of the methodology developed by Silva (2020), in order to validate the instrument in another location; in addition to identifying the potentialities of the public space evaluated, pointing out some weaknesses that can support future interventions.

Objective

Evaluate the spatial quality of a public space and its immediate surroundings, considering different elements that can positively or negatively impact the vitality of this place. The case study is applied in Largo São João, located in a small demographic city, in the interior of the state of São Paulo.

Object of Study: Largo São João

In order to continue the investigations on the quality of the space of public spaces located in central areas of small cities, this article presents a case study carried out in Largo São João, located in the central region of the Tourist Resort of Avaré.

Due to its location, situated on the main commercial street of the city, the place attracts many people daily. It is a place of passage and permanence, whether for rest or for the practice of cultural and leisure activities carried out during the week and on weekends.

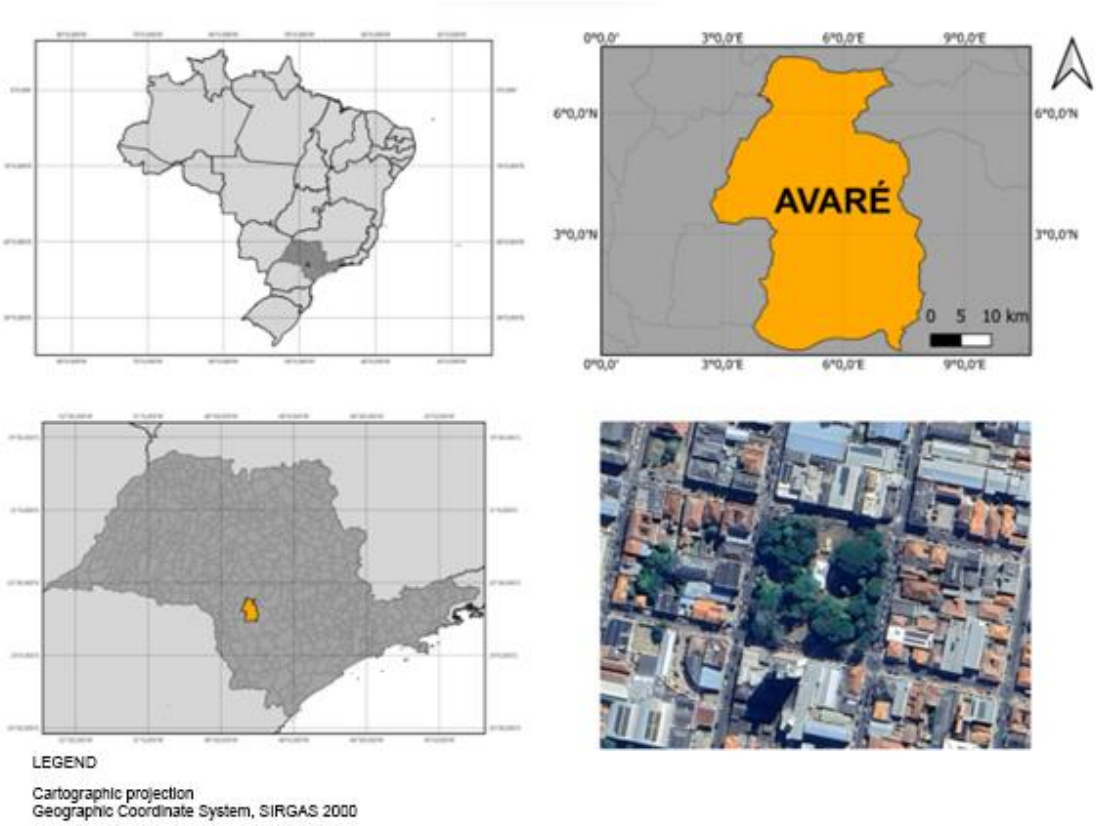
Implanted in an area of approximately 8,526.45 m² (Figure 1), it is composed of dense forestation, with native and exotic species, large and medium-sized palm trees, forages and grasses, as well as equipment such as: bandstand, light source, public bathroom, trash cans and benches. The surface of the pavement inside Largo São João and the surrounding sidewalks are made of Portuguese stone.

Inaugurated at the beginning of the nineteenth century, throughout its history, the place has undergone several renovations: alteration of the type of afforestation – around 1908, implementation of pergolas and renovation of the bandstand and landscaping, construction of a monument to the Pracinhas and implementation of the fountain of arts – works by the sculptor Fausto Mazola, date back to the 1940s, and later in the 1960s the alteration in the landscaping modifying its original implantation. However, it maintains the characteristic of being a meeting point for the cultural, civic and political activities of the city. Since the 1990s, the municipal administration of Avaré has offered cultural activities aimed at children, adults and the elderly on weekends, including the installation of inflatable toys and live music (also known as "baile").

The urban network of the central area of the city where Largo São João is located is orthogonal, with diversified land use, with a predominance of residential, commercial, service and institutional buildings.

Figure 1

Contextualization map of the municipality *of Avaré and the contextualization of the surroundings of the study area (without scale)*



Source: QGIS, 2023 and adapted from Google Maps, 2023

Methodology

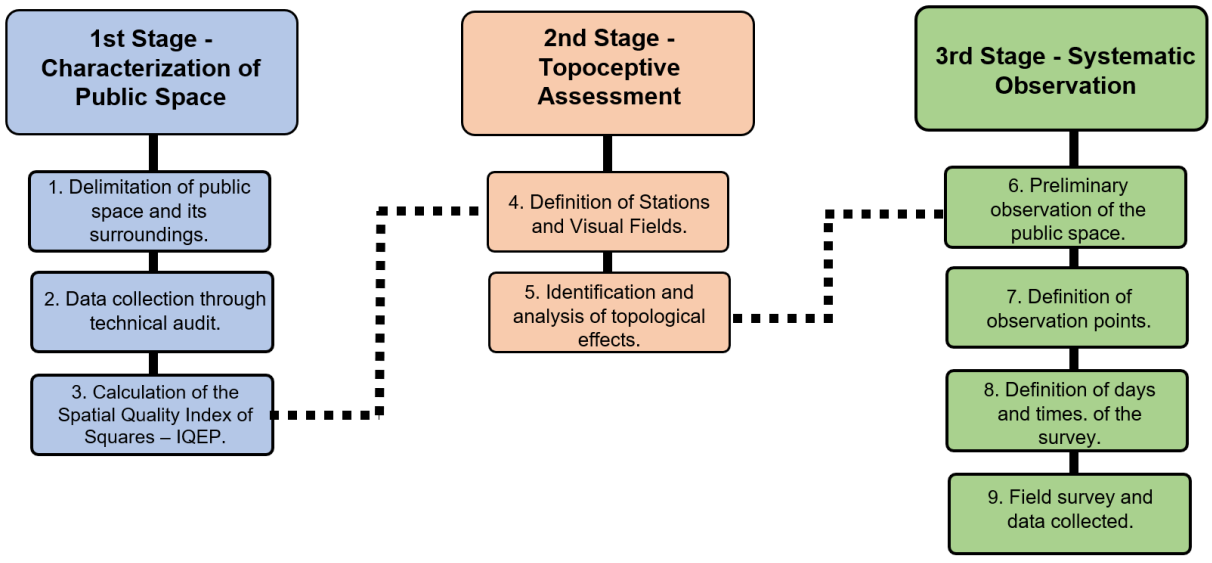
The evaluation of the spatial quality of the public space and its immediate surroundings uses multiple methods, based on a quantitative-qualitative approach, where the different instruments allow the analysis of different elements that make up the pedestrian space in a public

space and its surroundings, in different contexts of tourist cities, but predominantly in central areas of small towns. The methodology includes the use of performance indicators and an index, analysis of urban scenarios, and systematic observation (Silva, 2020).

Structured in 3 stages, the methodological process initially analyzes the internal and external morphological aspects of the public space (square, largo, garden, etc.) and its surroundings, using performance indicators and an index (1st stage). The second stage, complementary to the previous one, allows the identification and evaluation of the topological and perceptual effects provided by the morphological elements of the public space through the analysis of scenes from the surroundings of the site using photographic records, from the application of the method called topoceptive performance. The third stage uses observation techniques to identify the activities and behavior of users in the evaluated space, and thus assess their vitality (Figure 2).

Figure 2

Methodological process flow diagram



Source: Adapted from Silva (2020).

1 Stage: Spatial Characterization of Public Space – the internal and external morphological aspects of the object of study are evaluated through the use of a list of performance indicators and an index, developed by Silva (2020), called the Spatial Quality Index of Squares (in Portuguese Índice de Qualidade de Praças - IQEP).

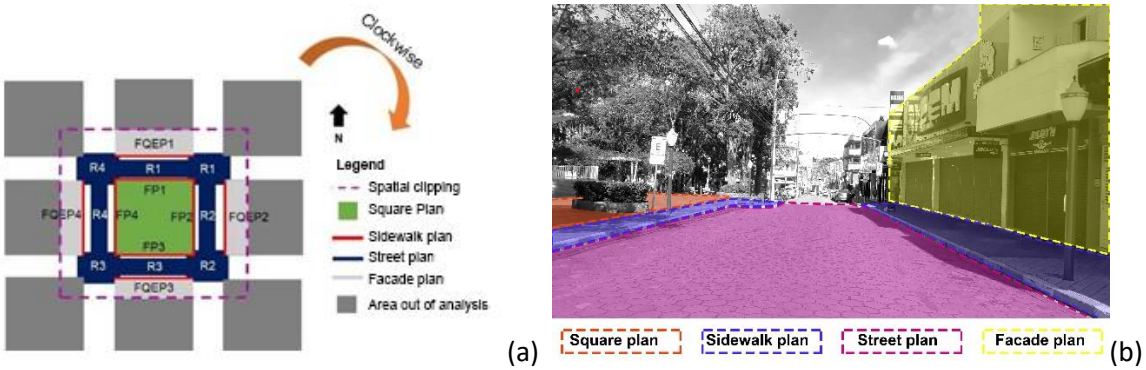
The application of this index is structured in four steps: (i) delimitation of the public space and its surroundings, based on the identification of the units of analysis; (ii) data collection through technical audit; and (iii) calculation of the Spatial Quality Index of Squares – IQEP (Figure 2).

Delimitation of the public space and its surroundings and identification of the units of analysis – The instrument was developed to evaluate the block of a public space (square, largo or park) and the blocks adjacent to it, depending on the direct or indirect interference that both may cause in the use of this space by users (Figure 3a). In this instrument, the area of the square, the facades of the adjacent blocks, and the road system surrounding the public space are evaluated. Each of these elements receives a specific nomenclature with corresponding numbering (as an example, the nomenclature in Portuguese, of a square: 'FP' - Face Praça (Square Face), 'FQEP' - Face Quadra do Entorno da Praça (Square Surroundings Block Face) and 'R' - Rua (Street), all acronyms must be followed by numbering. Silva (2020) suggests starting the numbering clockwise, starting from the upper block (North) in relation to the North/South axis (Figure 3a).

The units of analysis correspond to the 4 two-dimensional planes that involve the analyzed public space and its surroundings, so called: (i) *Horizontal public space plan*- delimited by the area of the public space, where its internal elements are evaluated; (ii) *Horizontal sidewalk plan* - plan of pedestrian circulation, delimited by the sidewalk adjacent to the internal area of the public space and the sidewalks of the blocks surrounding the public space; (iii) *Horizontal street plan* - the streets and road intersections around the public space are evaluated and; (iv) *Vertical facade plan* - represented by the facades of the buildings located around the blocks surrounding the public space (Figures 3a and 3b).

Figure 3

Example of definition of spatial cut-out and numbering of block faces (a) and Plans of analysis of public space and its surroundings (b)



Source: Silva (2020, p. 48) and Authors, 2022.

Technical Audit - Data collection must be carried out with a technical audit carried out exclusively from an on-site survey. The hierarchical structure proposed by Silva (2020) is adopted, comprising 56 indicators grouped into the 4 analysis planes (Square – Public Space, Sidewalk, Street and Facade), Table 1.

Silva (2020) proposes a model form (inspection forms) for each plan analyzed, Table 2 presents an example. In addition, the photographic record should be used as an auxiliary tool to identify and analyze some aspects that cannot be extracted directly from the data collected in the field.

The evaluation criterion of the indicators corresponds to a numerical range between 0 (worst score) and 1 point (best score), in which each indicator can have a different numerical scale for evaluation. In Silva's (2020) proposal, the score of the indicators is represented by the values: (i) 0.00 or 1.00; (ii) 0; 0.50; or 1.00; (iii) 0.00; 0.33; 0.66; or 1.00; or (iv) 0.00; 0.25; 0.50; 0.75; or 1.00 (Table 2).

Table 1

Hierarchical structure of indicators, by plan

Horizontal Square Plan	Horizontal Sidewalk Plan	Vertical Façade Plan	Horizontal Street Plan
1. Type of flooring. 2. Physical condition of the floor. 3. Cleaning. 4. Bench. 5. Maintenance condition of the benches. 6. Leisure equipment. 7. Drinking fountain. 8. Public Bathroom. 9. Trash cans. 10. Trash bin for selective collection. 11. Stage and/or bandstand. 12. Water mirror and/or fountain. 13. Maintenance status of the water mirror and/or fountain. 14. Vegetation. 15. Natural shading. 16. Public safety. 17. Economic attractions. 18. Homeless people.	1. Effective width of the sidewalk. 2. Type of flooring. 3. Sidewalk surface condition. 4. Permanent obstruction on the sidewalk. 5. Temporary obstruction on the sidewalk. 6. Unevenness. 7. Accessible crossing. 8. Tactile floor on guide lowers. 9. Vehicular and pedestrian conflict. 10. Cross slope. 11. Longitudinal slope. 12. Shading. 13. Lighting. 14. Headroom of overhead obstacles. 15. Vertical crossing signs. 16. Vertical signs of maximum vehicle speed. 17. Orientation and identification. 18. Presence of buffer zone.	1. Use of buildings. 2. State of conservation of buildings. 3. Evening and day public use. 4. Physically permeable facades. 5. Visually permeable facades. 6. Abandonment aspect. 7. Color and texture. 8. Horizontality vs. verticality. 9. Visual pollution. 10. Size of the court.	1. Presence of a crosswalk. 2. Maintenance status of the crosswalk. 3. Traffic exposure. 4. Street width. 5. Speed reducer on collector and/or arterial roads. 6. Crossing and parking. 7. Parking spaces for people with disabilities. 8. Parking spaces for the elderly.

Source: Adapted from Silva (2020).

Table 2

Example of an evaluation worksheet of the Vertical Facades Plan

Indicators		Analysis criteria	Point	FQEP1	FQEPn
F1	Uses of buildings	Presence of ≥ 75% of the block face with variations in the uses of the buildings.	1.00		
		Presence between 74% and 50% of the block face with variations in the uses of the buildings.	0.66		
		Presence between 49% and 25% of the block face with variations in the uses of the buildings.	0.33		
		Presence ≤ 24% of the block face with variation in the uses of the buildings.	0.00		
F2	State of conserva-tion of buildings	Block face with ≥ 75% of the buildings in good condition.	1.00		
		Block face between 74% and 50% of buildings in good condition.	0.66		
		Block face between 49% and 25% of buildings in good condition.	0.33		
		Block face with ≤ 24% of the buildings in good condition.	0.00		
F3	Evening and daytime public use	≥ 75% of the buildings have public use ≥ 10 hours of daily operation.	1.00		
		Between 74% and 50% of the buildings have public use ≥ 10 hours of daily operation.	0.66		
		Between 49% and 25% of buildings have public use ≥ 10 hours of daily operation.	0.33		
		< 30% of the buildings are for public use ≥ 10 hours of daily operation.	0.00		
F4	Physically permeable facades	From 10 to 14 pedestrian entrances for every 100 m of block face.	1.00		
		From 9 to 6 pedestrian entrances for every 100 m of block face.	0.66		
		Between 3 and 5 pedestrian entrances for every 100 m of the block face.	0.33		
		Between 0 and 2 pedestrian entrances for every 100 m of the block face.	0.00		
F5		≥ 75% of the block face area is visually permeable.	1.00		

Indicators		Analysis criteria	Point	FQEP1	FQEPn
	Visually permeable facades	Between 74% and 50% of the area of the block face is visually permeable.	0.66		
		Between 49% and 25% of the face area is visually permeable.	0.33		
		≤ 24% of the face area is visually permeable.	0.00		
F6	**Abandon-ment aspects**	≤ 24% of the buildings on the block face have some aspect of abandonment.	1.00		
		Between 25% and 49% of the buildings on the block face have some aspect of abandonment.	0.66		
		Between 50% and 74% of the buildings on the block face have some aspect of abandonment.	0.33		
		≥ 75% of the buildings on the block face show some aspect of abandonment.	0.00		
F7	**Color and texture**	≥ 75% of the block face with varying colors and textures.	1.00		
		Between 74% and 50% of the block face with varying colors and textures.	0.66		
		Between 49% and 25% of the varied block face with varying colors and textures.	0.33		
		≤ 24% of the block face with varying colors and textures.	0.00		
F8	**Horizontality vs verticality**	≥ 75% of the block face area is horizontalized.	1.00		
		Between 74% and 50% of the area of the block face is horizontalized.	0.75		
		Between 49% and 25% of the block face is horizontalized.	0.50		
		≤ 24% of the block face is horizontalized.	0.25		
		100% of the block face is verticalized.	0.00		
F9	**Visual pollution**	Absence of visual pollution throughout the sidewalk segment. The environment is pleasant and has good legibility.	1.00		
		Presence of visual pollution in part of the sidewalk segment. The environment is partially pleasant, as it has some deficiency in legibility.	0.50		

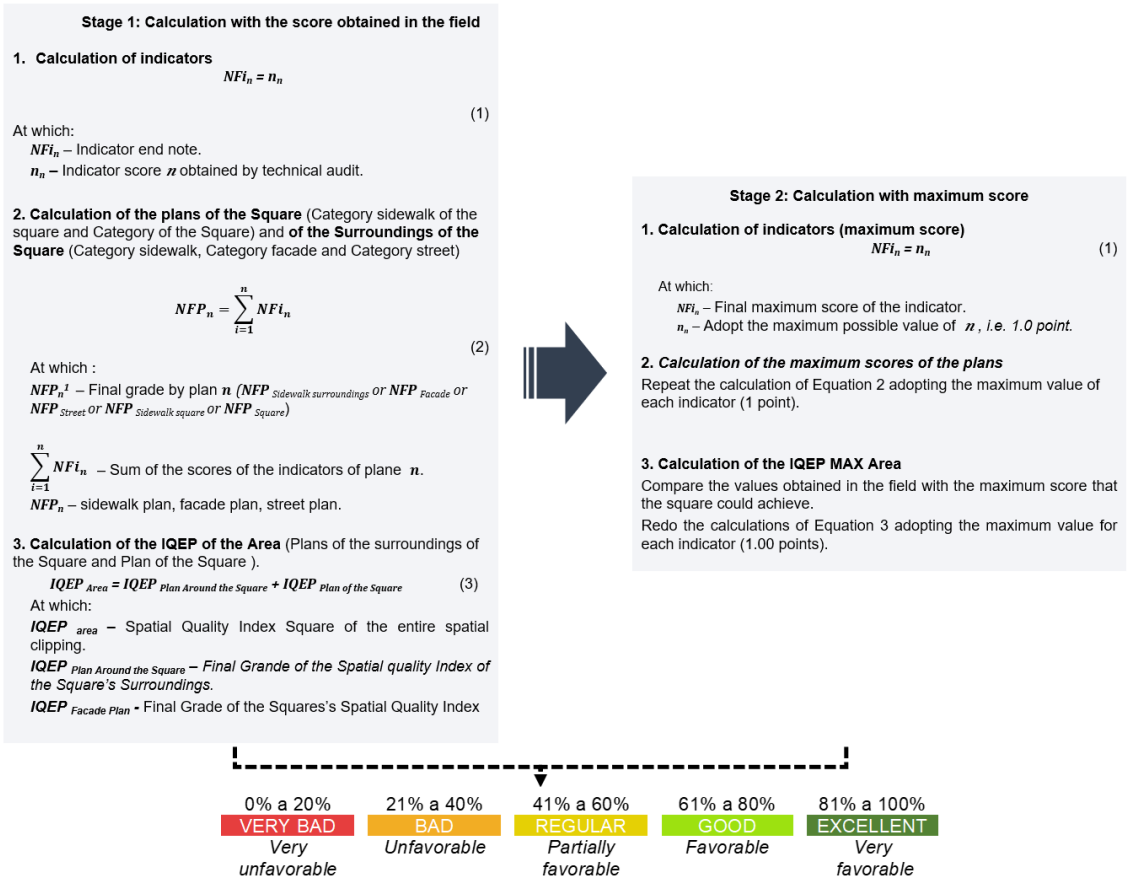
Indicators		Analysis criteria	Point	FQEP1	FQEPn
		Presence of visual pollution throughout the sidewalk segment. The environment is not pleasant and has poor legibility.	0.00		
F10	Size of the court	The lateral side of the block is ≤ 90 m long.	1.00		
		The lateral side of the block is 91 and 150 m long.	0.66		
		The lateral side of the block is from 151 to 180 m long.	0.33		
		The lateral side of the court is ≥ 180 m long.	0.00		

Source: adapted from Silva (2020, pp. 224-226).

Calculation of the Spatial Quality Index of Squares (acronym in Portuguese - IQEP) – the results of this calculation will assist municipal managers in decision-making to improve the spatial quality of the investigated object, in addition to its vitality. The procedures for the calculation of this index are subdivided into 2 steps: i) calculation of the IQEP with the data collected in the field and ii) calculation of the IQEP with the simulation of the maximum score of the indicators. Figure 4 summarizes the equations used in this method.

Figure 4

Summary of IQEP calculations



Source: adapted from Silva; Magagnin; Sources (2021).

The partial and global result of the index makes it possible to assess the spatial quality of the public space or its surroundings in an individualized way, by plan and by indicator, and comprehensive for the entire spatial cut, indicating punctually the elements that need more urgent interventions, for example, to ensure greater spatial quality and, consequently, to expand the use and permanence of people of different age groups in this public space.

The result of the evaluation of each stage and the grade obtained in the field is shown as a percentage. The actual score is compared with the five levels of spatial quality defined by Silva (2020).

Stage 2: Topoceptive Assessment – at this stage, the Topoceptive Performance analysis method, developed by Kohlsdorf (1996) and adapted by Silva (2020) to evaluate public spaces, is used. It allows the identification of the topological effects (relationship between the observer's body in space) and perceptual effects (urban scenery contained in the observer's Visual Field) of various scenes captured in the interior of squares or other public spaces**.** Morphological analysis from the perspective of Topoceptive performance allows us to determine "the morphological difference that the environment transmits to the observer, based on the expectations that users have in identifying and orienting themselves in the urban space" (Magagnin, 1999, p. 109).

The method uses the technique of sequential analysis, in which the observer (researcher) moves around the public space evaluated, using the walking mode, with the objective of representing graphically or by means of a photographic record, through scenic sequences, the morphological elements that stand out in the landscape and can interfere in the apprehension of this space (Kohlsdorf, 1996).

Data collection and analysis are structured in two stages: i) Definition of Stations and Visual Fields; and (ii) identification and analysis of topological effects.

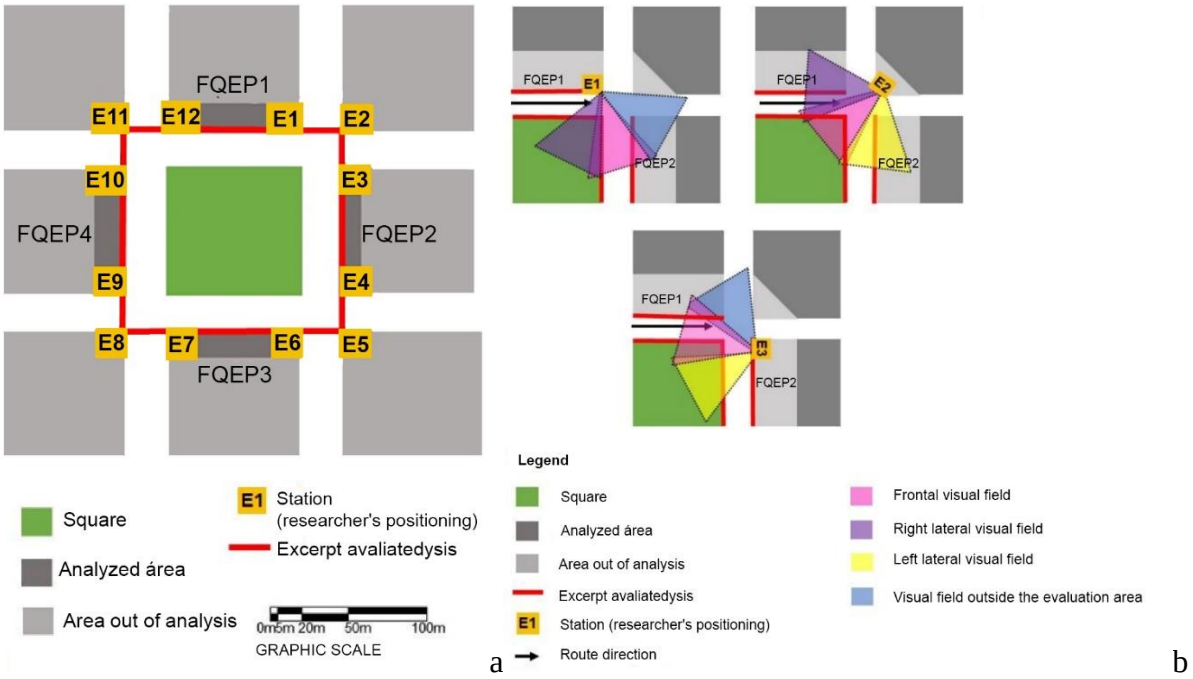
The first stage refers to the identification of the unit of analysis, considered by the three-dimensional space that encompasses the public space and its adjacent surroundings. In the case of a square, it refers to the indoor/outdoor area and the adjacent blocks (facades) (Silva, 2020). The morphological elements belonging to the vertical and horizontal planes that surround the square, the sidewalks and streets around the square are analyzed (Figure 5a).

Next, we must define the Stations and Visual Fields. Silva (2020) adapts Kohlsdorf's (1996) method, as proposed by Magagnin (1999), at which the public space of the street is evaluated from the sidewalk. The Stations are points of registration of the Visual Fields (records of scenic images). Each station is positioned on the sidewalk of a corner of the blocks around the square (Figure 5a). At each of these points, three Visual Fields (Frontal, Right Side and Left Side) should be recorded. For this scenic record, the observer must rotate his head about 45 degrees

to each side; thus, the angle of view of each visual field is about 60 degrees (Silva, 2020, p. 59), Figure 5b.

Figure 5

Definition of the location of the Stations and registration of the Visual Fields in the surroundings of the public space

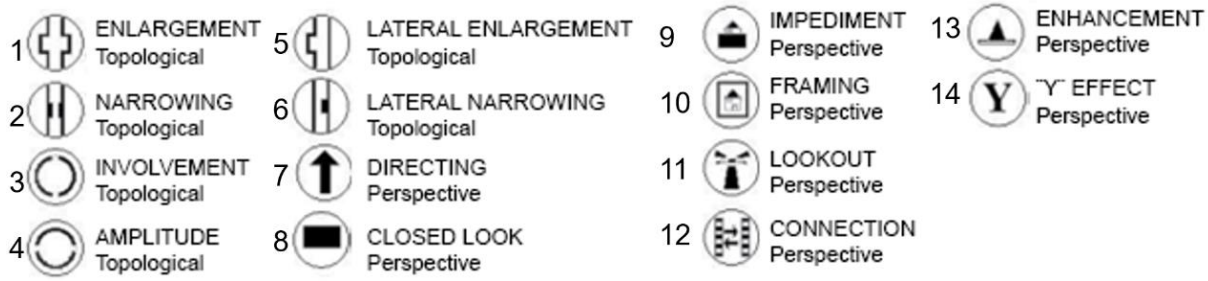


Source: Adapted from Silva (2020).

The evaluation of the records of each visual field allows us to identify which and how many Topological and Perspective elements are associated with this public space. For this analysis, visual effects can be represented spatially on a map, using pictograms (Figure 6). In this analysis, the researcher can identify: i) the number of topological and prospective effects; and ii) the predominance of one effect over the others (Silva, 2020).

Figure 6

Topological and Perspective Visual Effects Pictograms



Source: Silva (2020, p. 64).

3ª Stage: Systematic Observation - In order to understand the behavior of users in the use of public space, this stage uses Place Centered Behavioral Mapping (in Portuguese Mapeamento Comportamental Centrado no Lugar - MCCL) to record the activities, behaviors, and flows of displacement of users in the use of public space. This information, associated with the number of visitors, on different days of the week and on weekends, makes it possible to identify components and areas of the public space that may "attract" or "inhibit" certain uses or activities.

The application of this technique involves four stages: i) preliminary observation of the public space to identify the places where the researcher will make the observations and definition of the predominant categories and activities (represented by means of pictograms – Figure 7); (ii) definition of observation points; iii) definition of survey days and times; iv) field survey and analysis of the collected data (Map of flows of displacements of users and Map of places of stay and types of activities).

Silva (2020) suggests, for the effectiveness of the technique, that visits should be carried out at least on two working days and on weekends. The observation hours should consider the predominant land use of the surroundings, such as the opening hours of commerce, service or other activities carried out on weekends.

Figure 7

Pictograms referring to the activities identified in Largo São João in Avaré (SP)

Source: Adapted from Silva (2020, p. 68).

Results

In this section, we present the results obtained in the evaluation of Largo São João, located in the city of Avaré (SP), based on the analyses using (i) performance indicators and the IQEP index; (ii) topoceptive performance; and (iii) the behavioral map.

Spatial Quality Index of Squares (IQEP)

Largo São João, as it recently underwent a renovation (in 2021), its evaluation pointed out that, in general, the public space and its surroundings presented a Spatial Quality Favorable to the use and permanence of users (Table 3). Of the 5 plans analyzed, the Street Plan was the only one that received an evaluation classified as "regular", the other plans were considered "good", however, the percentage results show that many aspects still need to be improved.

Table 3

Results of the Spatial Quality Index of Squares (IQEP) of Largo São João

Plans	Maximum Score	Score obtained in the field	Result (%)
Square Plan	19.00	14.00	74%
Square Sidewalk Plan	76.00	51.77	68%
Surroundings Sidewalk Plan	76.00	53.58	73%
Facade Plan	40.00	28.53	69%
Street Plan	32.00	15.98	50%
IQEP area	**243.00**	**163.86**	**67%**

Classification: *Favorable Spatial Quality*

Legend	Very Bad	Bad	Regular	Good	Excellent
	0% a 20%	21% a 40%	41% a 60%	61% a 80%	81% a 100%

Source: Authors, 2022.

In the Square Plan, of the 19 indicators, 74% (14 indicators) received scores considered "excellent". The physical conditions of the floor and cleanliness, the presence of benches in perfect conditions of use and clean, in addition to the presence of several trash cans, drinking fountains, tents or carts of food and handicrafts - considered economic attractions, recently renovated public toilet, the presence of a bandstand, fountain, and natural shading throughout the square contributed to the positive evaluation of this plan and to the permanence of users in the place. Negative aspects accounted for 26% (corresponding to five indicators), with a "very poor" score, and are associated with the type of floor (Portuguese stone, this type of floor has a slippery surface that can lead to people falling, and is difficult to maintain, which can result in unevenness and holes), absence of leisure equipment, absence of trash can for selective collection, poor state of conservation of the water mirror and/or fountain, and presence of homeless people.

Regarding the Square Sidewalk Plan, of the 19 indicators, 53% (10 indicators) obtained

an "excellent" score. The current condition of the sidewalk surface, the absence of temporary obstruction in the pedestrian crosswalk, the absence of unevenness, the absence of conflict between vehicles and pedestrians, the absence of longitudinal and transverse inclination, as well as the presence of visibility when approaching vehicles, the presence of a buffer zone and optimal lighting. The evaluation of the headroom of the aerial obstacles showed that the elements analyzed are in accordance with the technical standard of accessibility. The indicators with the lowest scores were the type of pavement (Portuguese stone), lack of tactile floor in sidewalk guide lowering's, absence of vertical signage at crossings and vertical signage of maximum vehicle speed. These factors contributed negatively to the evaluation of users' safety.

The results of the Surrounding Sidewalk Plan showed that of the 19 indicators evaluated, 58% (11 indicators) obtained the "excellent" classification (permanent obstruction in the pedestrian traffic lane, temporary obstruction in the pedestrian traffic lane, unevenness, conflict between vehicles and pedestrians, longitudinal slope, transverse slope, lighting, headroom of obstacles, orientation and identification, visibility of approaching vehicles and presence of buffer zone). Two indicators received low scores due to the absence of vertical signage at crossings and the absence of vertical signage of maximum vehicle speed.

In the Facade Plan, of the 10 indicators, 50% (5 indicators) obtained an "excellent" score (state of conservation of buildings, visually permeable facades, aspects of abandonment, color and texture, and horizontality x verticality). The indicator with the lowest score was nighttime and daytime public use. The opening hours of 93% of the buildings around this public space coincide with business hours (9 am to 6 pm from Monday to Friday and on Saturdays from 9 am to 5 pm), the exception is an ice cream parlor, which is open from 10 am to 10 pm every day of the week. During the week, at night, when the shops are closed, the movement decreases significantly, impacting the attractiveness of the place. However, on weekends, in spring and summer, the presence of cultural activities for adults ("Ball") and children (inflatable toys and mini strollers), makes the place a space of entertainment and leisure for the community.

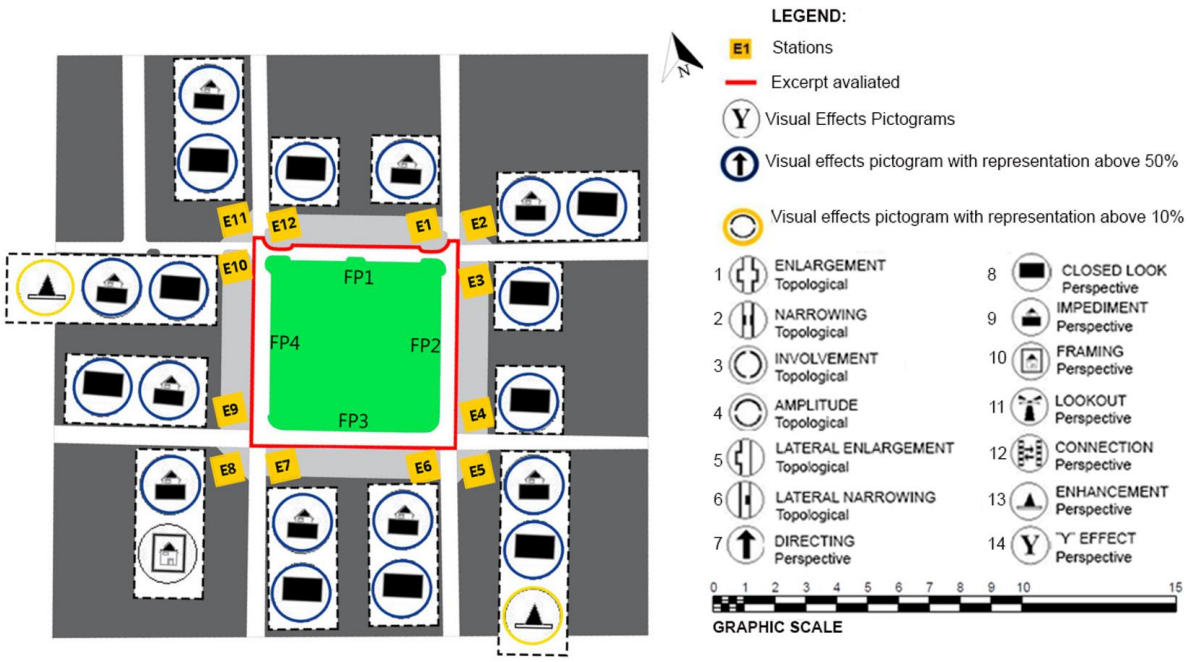
Regarding the Street Plan, of the 8 indicators, only 13% (one indicator) obtained an "excellent" score (indicator Presence of crosswalk identified at one of the road intersections). The other indicators that obtained low scores are related to the safety of users. Of these, one indicator (13%) obtained a "bad" score (State of maintenance of the pedestrian crossing) and two indicators (25%) obtained a "very bad" score (Speed reducer on collector and/or arterial roads and Crossing and parking). The 4 road intersections around Largo São João had pedestrian crossings, however, they were in poor maintenance conditions, with worn paint and the presence of potholes. No road intersection presented speed reducers such as speed bumps, elevated crossings, among others, that could increase pedestrian crossing safety. Although the local assessment found the presence of road signs for pedestrian crossing, the small distance between the delimitation corners of the Largo São João block with the delimitation of the first parking spaces, evidenced a compromise in the visualization of vehicles by pedestrians, so that the crossing could occur safely.

Topoceptive assessment

The evaluation of the configurational aspects associated with the presence of vegetation in Largo São João, using topoceptive analysis, showed that the public space provides three predominant visual effects: Closed Visual, Impediment and Enhancement. These effects are related to the shape of the block, the size of the trees and the density of the vegetation present inside the public space and in its surroundings, and by the presence of urban furniture (bandstand and fountain), in addition to the height of the surrounding buildings. The other effects were not found or were very low (up to 10%), Figure 8.

Figure 8

Perceptual Effects at each station in the Square



Source: Authors, 2022.

The *Closed visual* effect was identified in 83% of the Stations (10 Stations), as a result of the existence of medium and large trees, and the dense canopy of the trees, which limits the observer's view. The presence of a newsstand and a handicraft stall (Stations 10, 11 and 12) also prevent the view to the interior or exterior of the square.

The *Visual Impediment* effect, identified in 75% of the Stations (9 Stations), is due to the dense vegetation of the place, which partially limits the field of vision of pedestrians, allowing, albeit little, the visualization of some elements in the background, such as the urban equipment in the square. In 17% of the Stations (2 Stations), the *Highlight* effect can be observed due to the presence of the fountain and a horizontal building (identified from a distance), as an element of visual highlight.

Systematic Observation

The observations took place in October and November 2022, in the morning, afternoon, and evening. The activities and the number of users who use Largo São João during the week and on weekends are different.

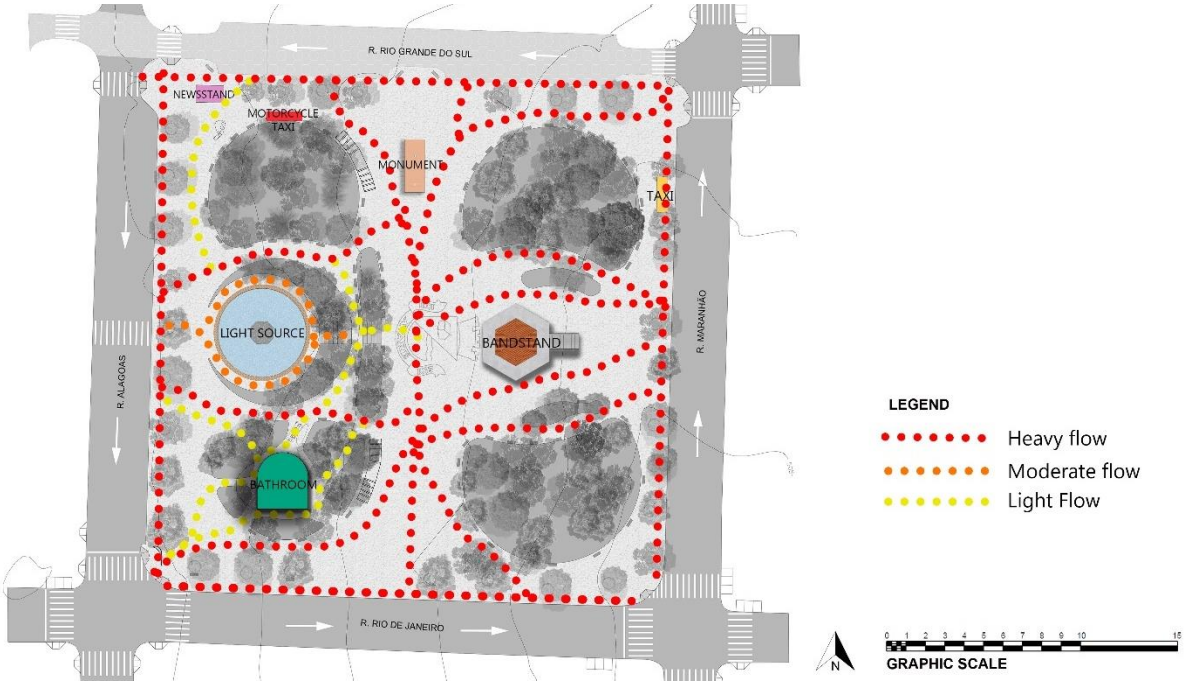
During the week, an average of 13 to 37 people per day remained in the square and on weekends the number was 8 to 49 people per day. The length of stay ranged from 20 min to 1 hour, and on weekends, on Saturdays and Sundays, at the time of the "Dance" (7:30 pm to 10 pm), the time of stay of users was from 2 hours to 3 hours and the number of users increased to an average of 75 people. The flow of people who use the place as a passage has changed significantly, because during the week between 90 and 700 people passed through the place, and on weekends the average number of people varied between 120 and 1000 people.

The analysis showed that the flow of users occurs in almost the entire area of Largo São João, due to its location in the urban network – implanted in the commercial area of the central region. This factor means that this space is predominantly used as an area of permanence and passage (access to commercial and banking enterprises in the surroundings of this region) by the population that frequents the central area of the municipality (Figure 9).

The behavioral map revealed that the least used areas are those with visual impairment from some construction, and where the paths are narrower, around the bathroom, newsstand and handicraft kiosks. And, the most used spaces for people to stay are the benches located around the light source and the bandstand.

Figure 9

Correlation of observed flows and places of stay on weekdays and weekends

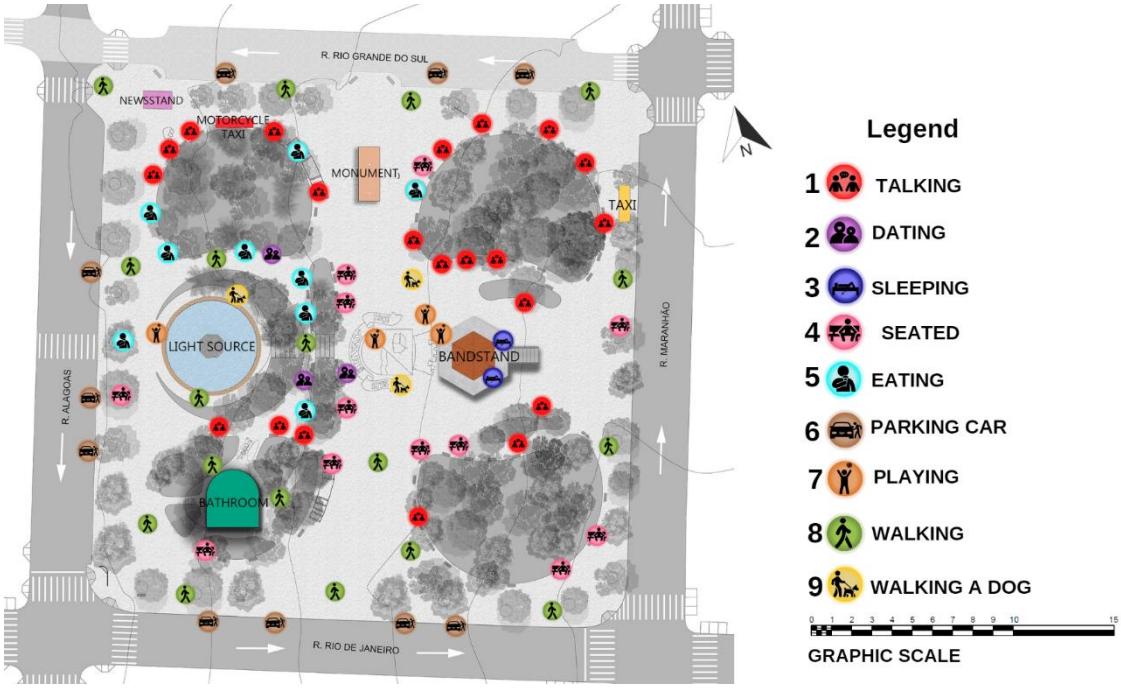


Source: Authors, 2022.

Regarding the activities identified in this public space during the week, it was observed that most people use the place to rest, or to wait for someone. The users, accompanied or alone, use the place to pass the time, to talk to other people, to date, to eat, to walk the dog, to walk, and most of them are retired men. On weekends, the number of people accompanied (families and friends) increases. The square is used by families for leisure activities, such as: sitting on the benches in the square, eating ice cream, eating popcorn, churros and hot dogs, playing (trampoline, inflatable slide and mini strollers). Other users use the place to dance (dance - which takes place on weekends - Saturdays and Sundays), eat and talk to friends (Figure 10).

Figure 10

Summary of the main points of permanence and activities developed in the square



Source: Authors, 2022.

Discussion

The contribution of this article is based on the analysis of a public space, adopting multiple methods. The combination of different techniques allowed us to understand in a deeper and complementary way the problems that interfere with the use and vitality of a public space in a Brazilian city of small demographic size. In addition, the results of the different techniques may subsidize the elaboration of design guidelines, as well as in the proposition of some activities to requalify the public space.

Studies show that public spaces – squares or largos, implanted in cities of different demographic sizes, in different areas of the urban network (central areas or neighborhoods), have spatial configurations (types and sizes) and elements that interfere in the spatial quality and use of space (Angelis et al., 2005; Costa, 2008; Praliya & Garg, 2019; Silva, 2020). Faria and Trigueiro (2000), Paula (2010) and Silva (2020) identified that the spatial configuration interferes with

existing activities and the use of public space.

Aspects related to comfort were identified by Brandão (2002), De Angelis et al. (2004), Monteiro (2015), Heemann and Santiago (2015) and Silva (2020). Comfort can be associated with several factors, such as the availability of places to sit (Monteiro, 2015; Heemann & Santiago, 2015). The presence of shading, associated with thermal comfort, contributes to the quality of the space, as it encourages users to stay in the place, especially in regions with a hot climate (Tonon, 2019).

The diversity of use or activities, identified in the research of De Angelis et al. (2004), Mora (2009), Heemann and Santiago (2015) and Gehl (2010) is related to the vitality of public space. A space that provides users with a diversity of activities (cultural and leisure), for different age groups tends to be used by a greater number of people.

Safety is another factor associated with the presence of people in public space. In addition to being attractive (pleasant, clean and well cared for), it should offer safety at all times of the day (Brandão, 2002; De Angelis et al., 2004; Mora, 2009; Gehl, 2010; Monteiro, 2015; Heemann & Santiago, 2015; Maia, 2018; PPS, 2018; Silva, 2020). Factors such as the presence of adequate lighting, activities around the public space that promote day and night use, and policing are elements that contribute to the feeling of security of the space.

The presence of problems in the floor (holes, irregularities, weeds, dirt, loose stones), as well as unevenness in the floor can make it difficult and often impossible for people with reduced mobility (the elderly, pregnant women, wheelchair users, etc.) or mothers with strollers, in addition to being elements that can cause falls. These factors associated with spatial accessibility are common in many Brazilian public spaces (Paula, 2010; Maia, 2018; Silva, 2020).

Given the diversity of elements that can interfere with the quality of public spaces, it is possible to state that an analysis based on a single technique makes it difficult to fully understand all the factors that can have a negative impact on the use of this space. Thus, this article emphasizes the relevance of associating more than one methodological approach to evaluate

public spaces, such as squares and largos.

Conclusion

A place of permanence and meeting of people should be aspects to be strengthened in public spaces. According to Aita Pippi and Rodrigues Lautert (2019, p. 123) "the qualification of public spaces is reflected in the strengthening of interactions between citizens and their urban context".

The evaluation of the spatial quality of Largo São João, located in the central region of the city of Avaré (SP), through multi-methods, allowed us to understand that factors associated with spatial configuration, human behavior, accessibility, attractiveness, comfort, diversity of use, safety, aesthetic quality and spatial legibility can influence the quality and vitality of this public space.

The application of three techniques, performance indicators and an index, topoceptive analysis and systematic observation, showed that the methodology used is effective, as it allows the identification of different factors that can influence the use and permanence of users in this public space. The use of a single instrument would not make it possible, for example, to identify areas with greater or lesser flow of people, or places that, due to the presence of small constructions (bathrooms, newsstands and handicraft kiosks), may contribute to making vision difficult, and may be considered unsafe by users, attracting fewer people. On the other hand, cultural and leisure activities positively influence the attractiveness of this space on weekends, especially in the late afternoon and evening.

In Largo São João, the presence of cultural and leisure activities for adults and children (Dance and toys) strengthens the local identity and leads to the appropriation of residents, which contributes to the effective use of the space. During the week, due to its location in the urban network of the city, its predominant use is characterized by being for passage or short stay. Positive aspects that contribute to the use of this space are related to shading and accessibility; as well as the presence of public toilets, benches, shading, good lighting, security, diversified use

of the surrounding buildings.

Although the public space has recently undergone a revitalization, the absence of other leisure facilities for different age groups (chess table, playgrounds, outdoor gym, among others), could attract a greater number of people both during the week and on weekends.

Future works can be developed using other case studies to further advance the understanding of public spaces implanted in central areas of small demographic cities, using the combination of different methodological instruments to seek similarities and differences in these environments.

References

Aita Pippi, L. G. & Rodrigues Lautert, A. (2019). Praças como espaços públicos relevantes: Conceitos pertinentes ao projeto. *Revista Projetar - Projeto e Percepção do Ambiente*, 4(1), 112–124. https://doi.org/10.21680/2448-296X.2019v4n1ID16796

Alberti, V., Alonso Raposo, M., Attardo, C., Auteri, D., Barranco, R., Batista e Silva, F., Benczur, P., Bertoldi, P., Bono, F., Bussolari , I., Caldeira, S., Carlsson, J., Christidis, P., Christodoulou, A., Ciuffo, B., Corrado, S., Fioretti, C., Galassi, M.C., Galbusera, L., Gawlik, B., Giusti, F., Gomez, J., Grosso, M., Guimaraes Pereira, A., Jacobs-Crisioni, C., Kavalov, B., Kompil, M., Kucas, A., Kona , A., Lavalle, C., Leip, A., Lyons, L., Manca, A.R., Melchiorri, M., Monforti-Ferrario, F., Montalto, V., Mortara, B., Natale, F., Panella, F., Pasi, G., Perpiña, C., Pertoldi, M., Pisoni, E., Polvora, A., Rainoldi, A., Rembges, D., Rissola, G., Sala, S., Schade, S., Serra, N., Spirito, L., Tsakalidis, A., Schiavina, M., Tintori, G., Vaccari, L., Vandyck, T., Vanham, D., Van Heerden, S., Van Noordt, C., Vespe, M., Vetters, N., Vilahur Chiaraviglio, N., Vizcaino, P., Von Estorff, U. & Zulian, G. (2019). *The future of the cities – Opportunities, challenges* and the way forward. Vandecasteele, I., Baranzelli, C., Siragusa, A. & Aurambout, J. editor(es). EUR 29752 EN, Serviço de Publicações da União Europeia, Luxemburgo. doi: https://doi.org/10.2760/364135.

Brandão, P. (2022). *O Chão da Cidade - Guia de avaliação do design de espaço público*. Lisboa. Editora Centro Português de Design.

Benedet, M. S. (2008). *Apropriação de praças públicas centrais em cidades de pequeno porte*. [Dissertação de Mestrado]. Universidade Federal de Santa Catarina.

Carmona, M. (2010). Contemporary public space, part two: classification. *Urban Des Int*. vol.15, n.2, 157-173. https://doi.org/10.1080/13574801003638111

Carmona, M. (2019). Principles for public space design, planning to do better. *Urban Des Int*. n.24, p. 47–59. https://doi.org/10.1057/s41289-018-0070-3

Costa, S. K. (2008). *Percepção Ambiental e Revitalização: as praças do bairro Salobrinho, Ilhéus, Bahia*. [Dissertação de Mestrado]. Universidade Estadual de Santa Cruz.

Dall'igna Ecker, V. (2020). O conceito de praça e a qualidade da paisagem urbana. *Revista Projetar - Projeto e Percepção do Ambiente*. [S. l.], v. 5, n. 1, p. 101–110. DOI: 10.21680/2448-296X.2020v5n1ID19559. Available in: https://periodicos.ufrn.br/revprojetar/article/view/19559

De Angelis, B. L. D.; Castro, R. M. de. & De Angelis, G. (2004). Metodologia para levantamento, cadastramento, diagnóstico e avaliação de praças no Brasil. *Engenharia Civil Um*, nº 20, 2004, p. 57-70. Available in: http://www.civil.uminho.pt/revista/artigos/Num20/Pag%2057-70.pdf

De Angelis, B. L. D., De Angelis Neto, G., Mota, C. R., Scapin, C. R., Mano, L. R., Schiavon, V. S., Hoffmann, A. C., Savi, E., Silva, G. F. F., Recco, J. H., Barcos, M., Santana, M., Fantini, P. R., Fantini, P. R., Domingues, R., Barbeiro, T. L. & Yuassa, V. N. (2005). Avaliação das praças de Maringá, Estado do Paraná, Brasil. *Acta Scientiarum. Agronomy*, 27(4), 629-638. https://doi.org/10.4025/actasciagron.v27i4.1677

Faria, M. G. & Trigueiro, E. B. F. (2000). A praça existe: estudando relações morfologia/comportamento em praças de Natal. *Anais do V Encontro Nacional de Ensino de Paisagismo em Escolas de Arquitetura e Urbanismo*, 01. p. 209-209b.

Gehl, J. (1987). *Life between Buildings: Using Public Space*. Washington DC: Island Press.

Gehl, J. (2010). *Cities for People*. Washington DC: Island Press.

Gürer, N., Imren Güzel, B., & Kavak, I. (2017). Evaluation on Living Public Spaces and Their Qualities - Case Study from Ankara Konur, Karanfil and Yüksel Streets. *IOP Conference Series*: Materials Science and Engineering, 245. https://doi.org/10.1088/1757-899X/245/7/072038

Heemann, J. & Santiago, P. C. (2016). *Guia do espaço público: para inspirar e transformar*. (2º. Ed). São Paulo: Conexão Cultural.

IBGE. (2022). *Censo Brasileiro de 2022*. Instituto Brasileiro de Geografia e Estatística. Accessed on: https://www.ibge.gov.br/estatisticas/sociais/populacao/22827-censo-demografico-2022.html?edicao=35938&t=resultados

Jacobs, A. B. (1993). *Great streets*. Cambridge, MA, MIT Press.

Kohlsdorf, M. E. (1996). *Apreensão da forma da cidade*. Editora, Ed. Univ. de Brasília.

Magagnin, R. C. (1999). *Análise de desempenho espacial e perceptiva do espaço público: o caso da Avenida São Carlos*. [Dissertação de Mestrado]. Universidade Federal de São Carlos.

Maia. M. L. (2018). *Proposta de um instrumento para avaliação da qualidade do ambiente físico de academias ao ar livre.* [Dissertação de Mestrado]. Universidade Estadual Paulista "Júlio de Mesquita Filho". http://hdl.handle.net/11449/180208

Mehaffy, M. (2019). Public Space in the New Urban Agenda. A Global Perspective on Our Common Urban Future. *The Journal of Public Space*, 4(4), 115-124. https://doi.org/10.32891/jps.v4i4.1236

Mehta, V. (2014). Evaluating Public Space. *Journal of Urban Design*, 19, 53-88. https://doi.org/10.1080/13574809.2013.854698

Monteiro, J. A. C. (2015). *Proposta metodológica para análise da qualidade urbanística de frentes de água o caso do Porto*. [Dissertação de Mestrado]. Universidade Fernando Pessoa. https://bdigital.ufp.pt/handle/10284/5189

Mora, M. A. R. (2009). Indicadores de calidad de espacios públicos urbanos, para la vida ciudadana, en ciudades intermedias. *Anais do 53º Congresso Internacional de Americanistas*. p. 1 – 21.

Paudel, U. & Pant, K. P. (2023). Understanding Vitality of Public Space: A Review with an Example of Capital City Kathmandu in Nepal. *Land Use Policy*. v.133. p. 1-15. https://doi.org/10.1016/j.landusepol.2023.106860

Paula, F. L. de. (2010). *O coração e o dragão: perspectivas da vida urbana em uma cidade fragmentada*. [Dissertação de Mestrado]. Universidade Federal do Rio Grande do Norte. https://repositorio.ufrn.br/handle/123456789/12353

Praliya, S. & Garg, P. (2019). Public space quality evaluation: prerequisite for public space management. *The Journal of Public Space*, 4(1), 93-126. https://doi.org/10.32891/jps.v4i1.667

Project for public space (Org.). (2023). What makes a successful place? https://www.pps.org/article/grplacefeat

Silva, R. B. A. da. (2020). *Instrumento para avaliar a qualidade espacial de praças: estudo em praças de áreas centrais*. [Dissertação de Mestrado]. Universidade Estadual Paulista "Júlio de Mesquita Filho". http://hdl.handle.net/11449/192650

Silva, R. B. A., Magagnin, R. C. & Fontes, M. S. G. C. (2021). Avaliação da qualidade espacial e vitalidade de praças*. Anais do 9º Congresso luso-brasileiro para o planejamento urbano, regional, integrado e sustentável.* p. 01-12.

Tonon, B. F. (2019). *Instrumento para Avaliação da Qualidade Espacial do Ambiente de Pedestres.* [Dissertação de Mestrado]. Universidade Estadual Paulista "Júlio de Mesquita Filho". http://hdl.handle.net/11449/182259

Whyte, William H. (1980). *The social life of small urban spaces*. Washington, D.C.: Conservation Foundation.

United Nations. (2022). Sustainable development goals. Available in: https://www.un.org/sustainabledevelopment/cities