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Walkability and accessibility around the Unified Educational Centers of São Paulo

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ABSTRACT

The objective of this article is to draw a brief analysis of the walkability and accessibility of the immediate surroundings of some Unified Educational Centers (CEUs) in São Paulo, through the available information on Geosampa and Google Maps websites, related to enrollments in the municipal network in São Paulo. When evaluating the walkability and accessibility in the immediate surroundings of some CEUs in São Paulo, the contrast between the implantation so generous and inviting for the environments inside the CEU and the maintenance of the existing pattern of exclusion of space for the pedestrian's circulation in its immediate surroundings becomes clear, leading to an invitation to reflect about how we can try to improve walkability in terms of accessibility and safety.

KEYWORDS: Walkability. Accessibility. Unified Educational Center CEU

1. INTRODUCTION

The Unified Educational Centers (CEUs) were designed to meet social and educational needs in areas on São Paulo City´s outskirts, offering, in addition to three integrated schools, the possibility of experiencing theater, art studios, indoor gymnasium courts, swimming pools, library and playgrounds, among other spaces. They are Educational Complexes that are not limited to School Education scope, representing a milestone of public investment in education, culture, sport, and leisure in the peripheral neighborhoods of the city, aiming at educational and social objectives (SOUZA, 2010).

Concerning the School Architectural Project parameter Connection with the community, listed by KOWALTOWSKY (2011) about the placement close to the community center, relationship with local commerce, the existing social and cultural infrastructure, and the openness for the community to use the school space in events, the CEU stands out for its implementation as urban equipment in highly vulnerable regions, without producing the gentrification process. Regarding the parameter Closing the area for security reasons, due to problems of violence, KOWALTOWSKY (2011) points out that schools must close themselves to provide a safe environment without becoming aesthetically ugly or resembling prisons.

In the past, there was no concern in general with regard to accessibility. From 1985, with the publication by the Brazilian Association of Technical Standards of the Accessibility ABNT NBR 9050, called Adequacy of Buildings and Urban Furniture for Disabled Persons, at least one access to the building intended for Persons with Disabilities (PwD) was required (item 4.1.1 a, p. 4). The edition of ABNT NBR 9050 of 1994, with errata of 1995, Accessibility of people with disabilities to buildings, space, furniture, and urban equipment, maintained the requirement of only one accessible entrance (item 5.1, p. 2). From 2004 edition, with the 2005 errata, ABNT NBR 9050 started to require that all entrances to new buildings be accessible (item 6.2.1, p. 40). ABNT NBR 9050 underwent another review in 2015, until reaching the current version, the 2020 edition with 2021 errata:

> 6.2.1 In buildings and urban equipment, all entrances, as well as the interconnection routes to the building's functions, must be accessible.
> 6.2.2 When adapting existing buildings and urban equipment, all entrances must be accessible and, if this is not possible, since technically proven, the greatest number of accesses must be adapted. In these cases, the distance between each accessible entrance and the others cannot exceed 50 m. The main building entrance, or the access entrance for the largest number of people, must meet all accessibility conditions. Access through secondary entrances is only accepted if all possibilities for adapting the main entrance have been exhausted and if technically justified (ABNT NBR 9050:2020/Er1:2021, p. 52, our translation).

Perhaps as a remnant of a previous understanding, that only an accessible entrance would be enough, there seems to be a standard of attention to accessibility only on the main access sidewalks of some CEUs. If we consider that Architecture is an expression of values and that the way we build reflects the way we live (FOSTER, 2015), the maintenance of the standard of existing sidewalks in the rest of the immediate surroundings of CEU itself contributes to the perpetuation of the standard lack of walkability and accessibility predominant in the city.

The Brazilian Inclusion Law (LBI), Law 13,146/2015, defined that it is up to the Union, on its own initiative and together with the States, the Federal District, and the Municipalities, to improve the conditions of sidewalks, public sidewalks, furniture urban and other spaces for public use, since its entry into force in 2016.

In the Municipality of São Paulo, Municipal Decree 59.671/2020, which consolidates the criteria for the standardization of sidewalks, determines in Art. 1st that the responsibility for the sidewalks that are limited with properties rests with the property owner, therefore, the responsibility for complying with accessibility standards and standards relating to sidewalks in the immediate surroundings of the CEU lies with the City of São Paulo.

> §1º The provisions of this decree apply to works or services for the implementation, conservation and maintenance of any sidewalk in the Municipality of São Paulo, regardless of who is responsible for its execution.
> §2 For the purposes of this decree, it is considered responsible:
> I - for the works and services related to the implantation, conservation, and maintenance of sidewalks that are limited with private properties:
> a) the owner of the property;
> b) the possessor of the property in any capacity;
> c) the holder of the useful domain or bare ownership of the property
> d) the condominium;
> II - for works and services related to the implantation, conservation and maintenance of sidewalks that are limited with own public properties, under their domain, possession, custody or administration:
> a) the Union, the bodies, and the entities of the respective Indirect Administration;
> b) the State, the bodies, and the entities of the respective Indirect Administration;
> c) the Municipality, the bodies and the entities of the respective Indirect Administration. (Municipal Decree 59.671/2020, Art. 1., our translation)

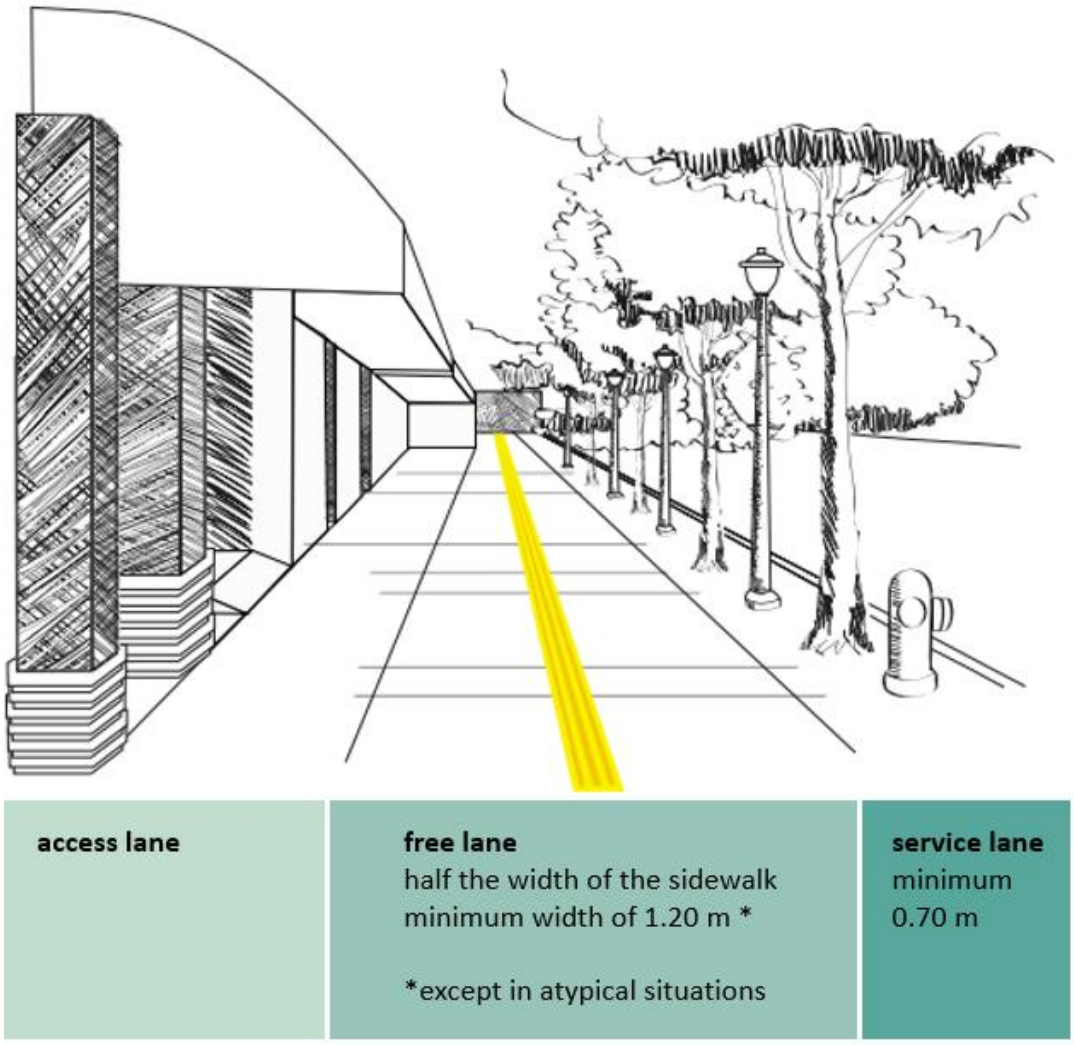
The first version of ABNT NBR 9050, in 1985, began to require the construction of lowering the curb by means of a ramp connected to the crossing lane (item 4.2.1.4, p. 16). The edition of the norm in 1994, with errata of 1995, started to demand floor with differentiated texture and color, containing the projection of the element's volume, for any urban furniture with greater volume in the upper part than in the base (item 10.4.3, p. 51). Since the 2004 edition with the 2005 errata, the directional tactile floor and the alert tactile floor were required to signal situations involving a security risk (item 5.3, p. 17 e item 5.14, p. 30-37). For implementation of any urban furniture, there must be guaranteed accessibility and free and continuous lane of 1.20 m wide for circulation.

The last revision of the ABNT NBR 9050 accessibility standard was carried out in 2020, with 2021 errata, but in the 1994 edition with 1995 errata, there was already a requirement for a minimum free lane of 1.20 m for sidewalks: "For implementation of any urban furniture, there must be guaranteed accessibility, and free and continuous lane of 1.20 m wide for circulation" (item 9.1.2, p. 42). Since the initial issue of ABNT NBR 9050 in 1985, there has been a

requirement to lower the curb by a ramp connected to the crosswalk. The first CEUs were inaugurated in 2003 and the last ones were delivered in 2020, but it is currently possible to see the lack of an access ramp in front of the crosswalk on the sidewalks and the failure to comply with the minimum free lane width, for example.

The Urban Design and Road Works Manual, made available by the City of São Paulo, seeking to ensure minimum quality criteria and the 2020 Sidewalks Primer of the City of São Paulo explain that sidewalks must be organized into up to 3 lanes, the service lane, the free lane, and access lane, subject to legal provisions. The service lane, with a minimum width of 0.70 m, adjacent to the curb, is intended for obstacles such as trees, poles, trash cans, ramps, benches, etc. A The free lane, allowing continuous flow, with a minimum width of 1.20 m (except in atypical situations), must be free of obstacles and unevenness, and must allow the path to continue. The access lane is not mandatory, it is in front of the property on sidewalks longer than 2 m, which may have vegetation, ramp, awning, temporary furniture.

Figure 1 – Sidewalks organization in up to 3 lanes



Source: Cartilha de Calçadas (Sidewalk Primer) 2020, p. 2 - City Hall of São Paulo (our translation)

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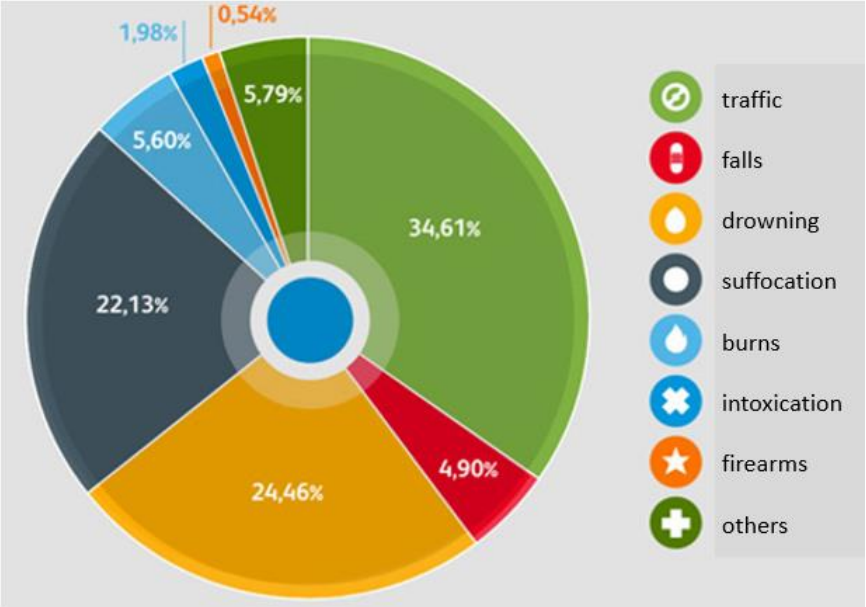
It is needed to promote walkability, with special attention around schools. The Safe Child Report 2017 warns that accidents are the leading cause of death for children aged 1 to 14 in Brazil. In 2016, traffic accidents were responsible for 34.61% of accidental deaths for children aged 0 to 14 years (1292 deaths).

Figure 2 – Deaths' percentage of children aged zero to 14 years by accident type.



Source: Relatório Institucional Criança Segura Brasil 2017 (Institutional Report Safe Child Brazil -our translation)

In 2020, there were 777 fatal traffic accidents in São Paulo, of which 308 were pedestrian accidents (considering deaths up to 30 days after the accident, the deaths of 6 fatal accidents in December 2020 occurred in January 2021). According to data from the Traffic Engineering Company of the Municipality of São Paulo (CET-SP), students led the list of occupations with the highest incidence of deaths in traffic accidents in São Paulo in 2020. Students were the main victims (10%), followed by retirees (8%). Among fatal pedestrian victims, the highest incidence was among retirees/pensioners (59). Among the fatal victims of drivers/passengers, the highest incidence was among students, 14.41%. Among motorcyclist fatal victims, the highest incidence was of motorcycle couriers, 16.52%, followed by students.

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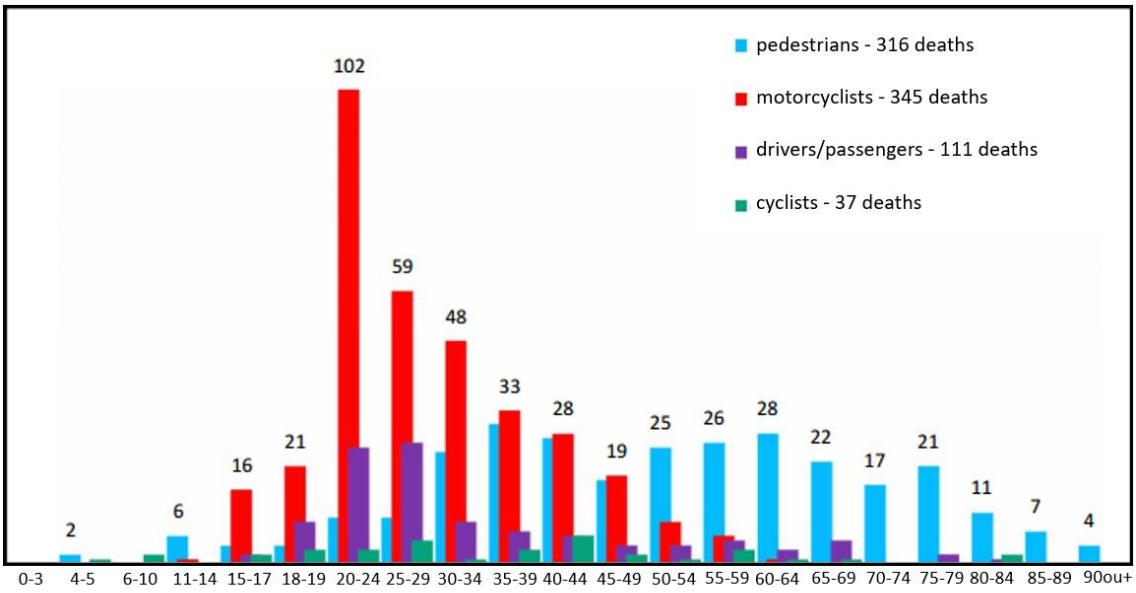
Figure 3 - deaths by type of user and age group in traffic accidents at São Paulo City in 2020



Source: CET – SP (our translation)

Table 1 – Most common occupations of dead victims by kind of user

No.	Occupation	pedestrian	driver/ passengers	motorcyclist	cyclist	Total
01	student	13	16	44	7	80
02	retiree/pensioner	59	3	1	2	65
03	motorcycle courier	0	1	57	0	58
04	unemployed	18	6	9	1	34
05	general auxiliary, general services, cleaning, production	10	4	6	2	22

Source: CET – SP (our translation)

When evaluating the walkability and accessibility in the immediate surroundings of some CEUs in São Paulo, the contrast between the generous and inviting implementation of the environments within the CEU and the maintenance of the existing pattern of exclusion of space for pedestrians' circulation in its immediate surroundings is evident, leading to an invitation to reflect on how we can try to improve walkability in terms of accessibility and safety.

2. OBJECTIVES

The objective of this article is to outline a brief analysis of walkability and accessibility of the immediate surroundings of some Unified Educational Centers in São Paulo and propose a reflection on walkability and accessibility under construction in the city.

3. METHODOLOGY / METHOD OF ANALYSIS

Through the analysis of available information on Geosampa and Google Maps sites, related to enrollments in the municipal network of São Paulo, made available by the City Hall of São Paulo, this article outlines a brief analysis of walkability and accessibility of some CEU's immediate surrounding in Sao Paulo.

The idealized CEU is not the same as the realized CEU, which can only be understood in everyday experience (SOUZA, 2010), hence the importance of carrying out post-occupation assessments.

> Observing the development of an equipment such as CEU throughout its recent history, it is possible to make an interesting analysis of the social and institutional transformations that have taken place. The small building adaptations that demanded many debates and hypotheses (...). The internal struggles between CEI and EMEI to use the park, the realization that the parking lot was small for the number of employees working in the Center. The decision to renovate the parking lot because everyone deserved to be contemplated. Again, many were disappointed because the CEU had been designed for teachers and students to arrive together using public transport, but others argued that the distance and the double shift prevented them from thinking in the same way. Many debates, many fights, many arguments, all new, but extremely enriching. All the people who participated in this process learned some lessons, something remained, and the beauty of human relationships was the true input for CEU´s construction (SOUZA, 2010, p. 213,214, our translation).

Gehl and Svarre (2018) analyzed the methods developed over the past fifty years to study the interaction between city life and public space and refined them into 12 criteria for evaluating public spaces: protection against traffic and accidents, against crime and violence, against unpleasant climates and unpleasant sensory experiences, ability to walk, ability to stand, ability to sit, ability to see, ability to speak/listen, ability to play, small-scale services (niceties such as signage, wastebasket), design to take advantage of climate's positive elements and design to enjoy positive sensory experiences (aesthetic qualities, nature). This study only analyzes issues related to safety in relation to traffic and accidents, and accessibility, considering that the quality of the route is desirable, but soon after achieving the minimum essential conditions for walkability.

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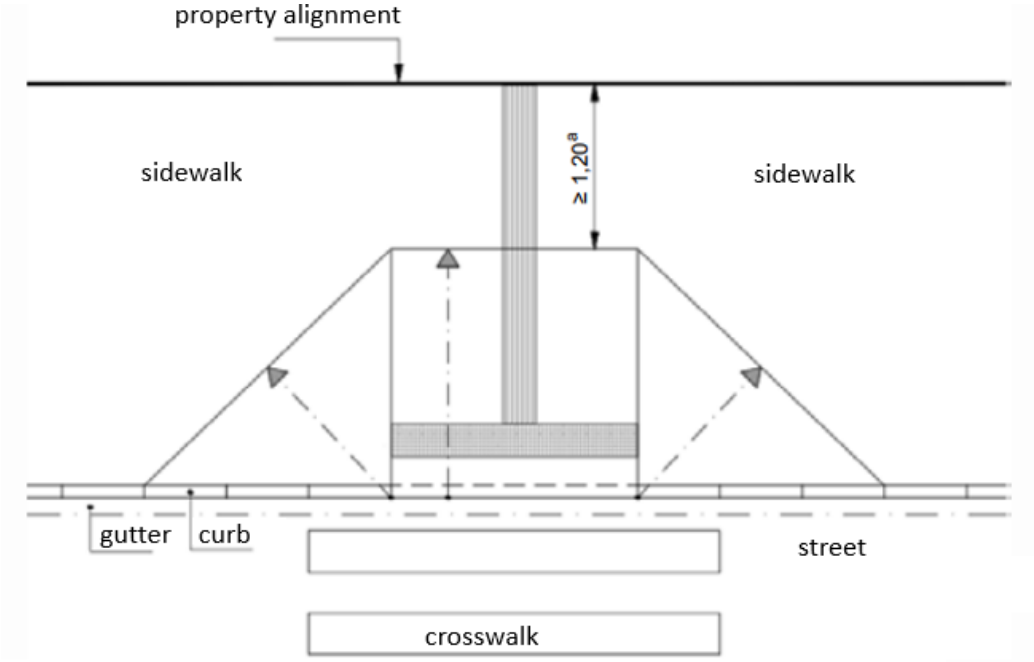
Figure 4 - Sidewalk lowering - Top view (Figure 94 of ABNT NBR 9050/Er1:2021)



a in exceptional cases, since it is justified, a minimum width of 0.90 m is allowed

Source: ABNT NBR 9050:2020/Er1:2021, p. 79 (our translation)

Compliance with the minimum required width was analyzed (0.70 m for the service floor lowering lane and 1.20 m of free lane), the presence of an access ramp for wheelchair users, the adequacy of the pedestrian lane, the presence of alert and directional tactile flooring.

> Sidewalk floor lowering must be built in the direction of the pedestrian crossing flow. The slope should preferably be less than 5%, being accepted up to 8.33% (1:12), in the longitudinal direction of the central ramp and on the side wings. It is recommended that the width of the lowering be greater than or equal to 1.50 m, assuming a minimum of 1.20 m. The lowering cannot reduce the sidewalk's free circulation lane of at least 1.20 m. See Figure 94. (ABNT NBR 9050/Er1:2021, p. 78, our translation).

From the 58 CEUs implemented in the city of São Paulo, 21 were built during the management of former mayor Marta Suplicy, 24 were built during the management of former mayor José Serra, continued by his deputy and successor, former mayor Gilberto Kassab, 1 was built under former mayor Fernando Haddad, 12 were started under former mayor Fernando Haddad and completed under former mayor Bruno Covas. For this brief analysis, it was verified 1 CEU delivered under the management of Marta Suplicy, CEU Alvarenga; 1 CEU delivered under the management of Gilberto Kassab, CEU Parque Bristol, 1 CEU delivered under the management of Fernando Haddad, CEU Heliópolis and 1 CEU delivered under the management of Bruno Covas, CEU Vila Alpina.

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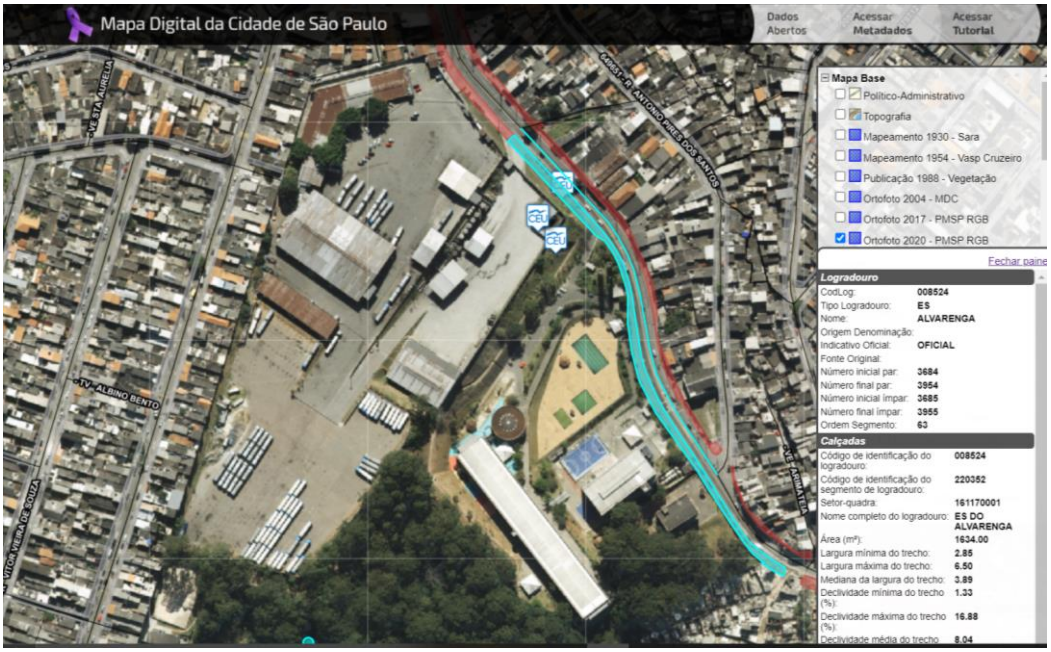
4. RESULTS

CEU Alvarenga, inaugurated on 12/09/2003, has the Child Education Center CEI CEU Alvarenga, the Municipal School of Child Education EMEI CEU Alvarenga, the Municipal Elementary School EMEF CEU (Alvarenga) Professor Paulo Gonçalo dos Santos, State Technician School ETEC Takashi Morita, and the Open University of Brazil UAB - Balneário São Francisco.

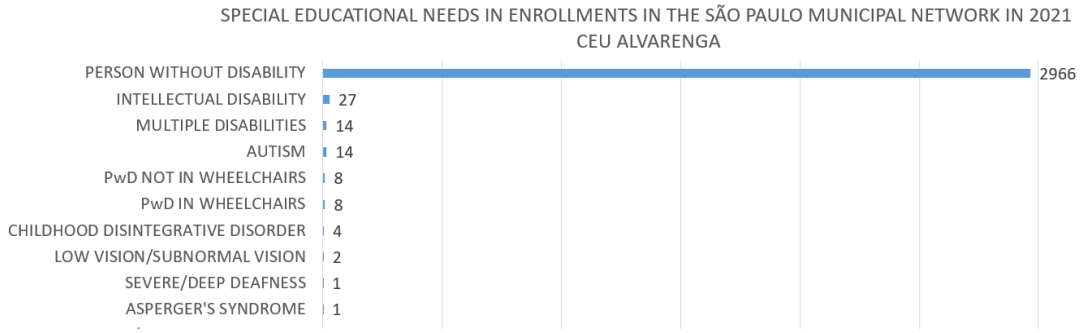
Figure 5 – Orthophoto 2020 of CEU Alvarenga



Source: Geosampa. Accessed: 22 Feb. 2023

2021' s enrollments in the Municipal Network at CEU Alvarenga indicate the presence of students with disabilities, as indicated in the graph, including people in wheelchairs and people with low vision.

Figure 6 – 2021' s enrollments in the Municipal Network of SP at CEU Alvarenga in modalities: complementary activity (ATCOMP), special education partner school (CONVEE), day care, professional education (EDPROF), youth and adult education (EJA), special education (ESPEC), primary education (FUND), secondary education (MÉDIO), youth and adult literacy movement (MOVA), guidance on educational informatics (OIE), guidance in the reading room (OSL), pre-school - early childhood education (PRÉ), pro-youth (PROJ), parallel recovery (REC) and inclusion support and follow-up room (SAAI)



Source: Prepared by the authors with data from the City of São Paulo

The sidewalk in front of this CEU does not have the minimum required widths, but it was inaugurated in 2003, before the first revision of the accessibility standard in 2004. However, almost 19 years after its inauguration, the sidewalk should have had an access ramp next to the crosswalk for person in a wheelchair, in addition to tactile directional signs and alerts for visually impaired people. The public telephones, suspended obstacles, do not have warning signs on the floor for people with visual impairments. The sidewalk has a hole in the floor and there is a pole narrowing the passage even further.

Figure 7 – Images of sections in front of the CEU on Estrada dos Alvarengas

Source: Google Maps (February 2022 Street View).

CEU Parque Bristol, opened in 2009, has CEI Parque Bristol, EMEI Profa. Luciana Azevedo Pompermayer, EMEF Profa. Mara Cristina Tartaglia Sena and UniCEU Parque Bristol / Polo Parque Bristol. None of the sidewalks around this CEU meet the standards regarding minimum width, obstacle-free width, and ramps. The minimum width of the sidewalk at the main entrance on Rua Artur Primavesi is less than the 2.06 m indicated on the Geosampa website. As the sidewalk does not have the service lane of 0.70 m and the free lane of 1.20 m, the presence of posts and traffic information signs makes it difficult for pedestrians to circulate. The wall can be used as a guideline for people with visual impairments, but there is no tactile warning sign.

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Figure 8 – Orthophoto 2020 of CEU Parque Bristol

Source: Geosampa. Accessed: 22 Feb. 2023

Figure 9 – CEU Main Entrance and Rua Professor Artur Primavesi' s street corner

Source: Google Maps (March 2019 Street View)

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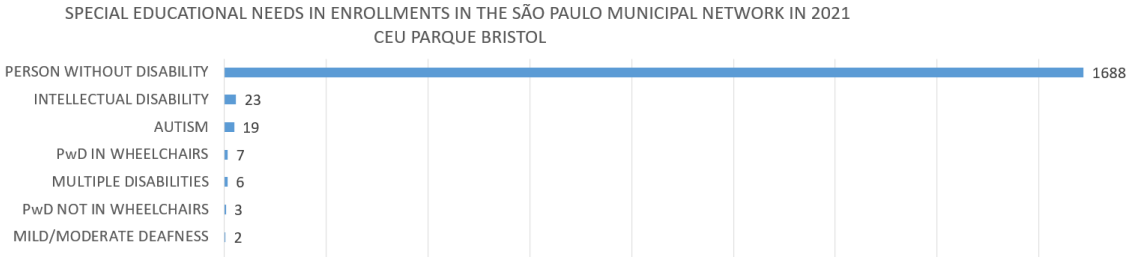
2021' s enrollments in the Municipal Network at CEU Parque Bristol indicate the presence of students with disabilities. Among others, there are people in wheelchairs and people with multiple disabilities, as indicated in the graph created with data from the City of São Paulo.

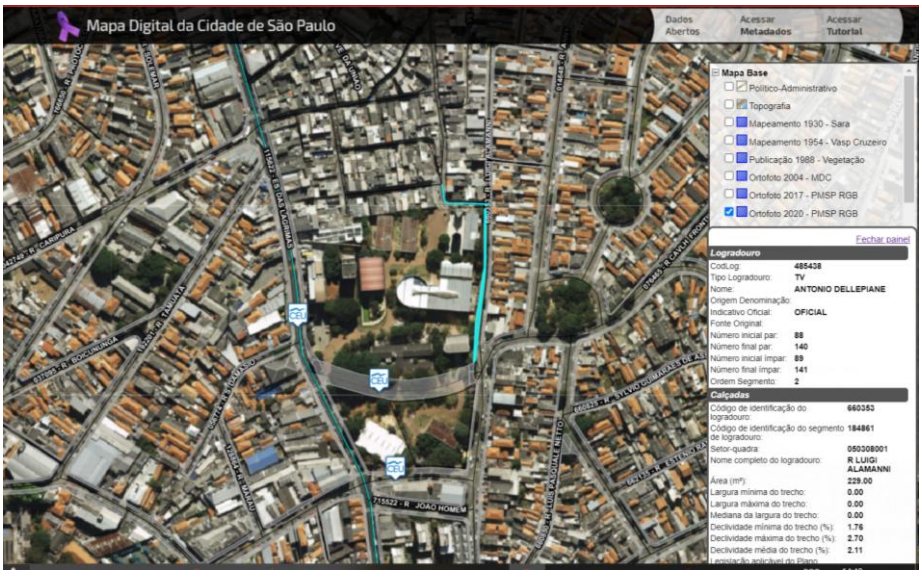
Figure 10 – 2021' s enrollments in the Municipal Network of SP at CEU Parque Bristol in modalities: complementary activity (ATCOMP), special education partner school (CONVEE), day care, professional education (EDPROF), youth and adult education (EJA), special education (ESPEC), primary education (FUND), secondary education (MÉDIO), youth and adult literacy movement (MOVA), guidance on educational informatics (OIE), guidance in the reading room (OSL), pre-school - early childhood education (PRÉ), pro-youth (PROJ), parallel recovery (REC) and inclusion support and follow-up room (SAAI))



Source: Prepared by the authors with data from the City of São Paulo

CEU Heliópolis Professora Arlete Persoli, inaugurated in 2015, has the CEIs Aparecida das Graças Silva Roseira, Nora Auler de Arruda Botellho and Simone Agnalda Ferreira, EMEI Antônio Francisco Lisboa, EMEF Presidente Campos Salles and ETEC Heliópolis.

Figure 11 –Orthophoto 2020 of CEU Heliópolis



Source: Geosampa. Accessed: 22 Feb. 2023

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Figure 12 – CEU Heliópolis sidewalks

Source: Google Maps (December 2021 to April 2022 Street View)

The sidewalk of CEU Heliópolis on Estrada das Lágrimas has a minimum width of 1.97 m and that of Rua São João Clímaco, 2.70 m, according to the Geosampa website. There is no access ramp to the crosswalk towards the crossing of Estrada das Lágrimas, on the corner of Rua São João Clímaco. There is an access ramp for pedestrians from the CEU to Travessa Antônio Dellepiane, but the CEU sidewalk on this street does not have the minimum width necessary to be accessible. The wall can be used as a guideline for people with visual impairments, but there is no tactile directional signage in the sections away from the wall (such as parking spaces for vehicles and construction sites), nor tactile warning signs. An architectural element suspended near the entrance from Rua São João Clímaco does not have tactile warning signs for people with visual impairments.

There are enrollments of people with disabilities, including people with multiple disabilities, a person with mild/moderate deafness and a person in a wheelchair.

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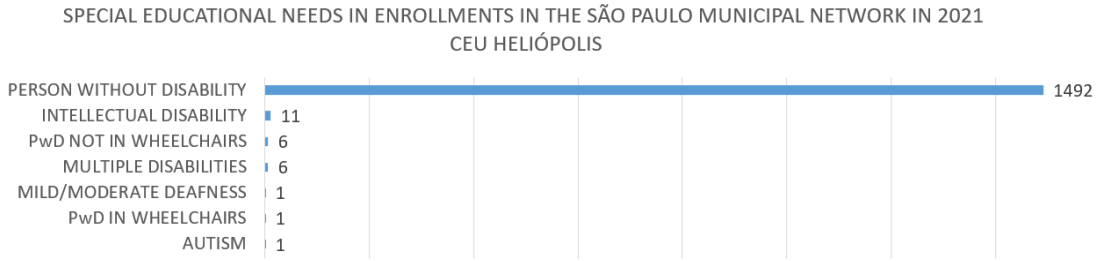
Figure 13 – 2021' s enrollments in the Municipal Network of SP at CEU Heliópolis in modalities: complementary activity (ATCOMP), special education partner school (CONVEE), day care, professional education (EDPROF), youth and adult education (EJA), special education (ESPEC), primary education (FUND), secondary education (MÉDIO), youth and adult literacy movement (MOVA), guidance on educational informatics (OIE), guidance in the reading room (OSL), pre-school - early childhood education (PRÉ), pro-youth (PROJ), parallel recovery (REC) and inclusion support and follow-up room (SAAI)



Source: Prepared by the authors with data from the City of São Paulo

The CEU Vila Alpina Professora Virgínia Leone Bicudo, delivered in February 2020, has the CEU CEMEI Vila Alpina, with 446 enrollments in 2021. According to the Geosampa website, the minimum width of the main access sidewalk on Rua João Pedro Lecor is 0.97 m, less than the minimum free width of 1.20 m required by the accessibility standard and by the Municipal Law of Sidewalks.

Figure 14 – Orthophoto 2020 of CEU Vila Alpina Professora Virgínia Leone Bicudo

Source: Geosampa. Accessed: 22 Feb. 2023

In front of the main access to this CEU, there are two car parking for people with disabilities, tactile directional and alert flooring. When the sidewalk is away from the main entrance towards Avenida Jacinto Menezes Palhares, the width of the sidewalk decreases and is strangled by the presence of posts. In a section away from the wall, there is no tactile floor.

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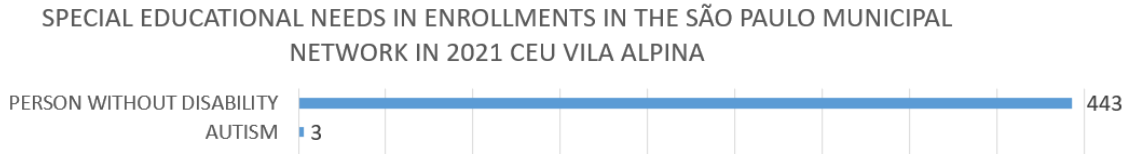
Figure 15 – CEU Vila Alpina sidewalks

Source: Google Maps (January 2022 Street View)

We did not find registrations of people with physical disabilities in this CEU in 2021, there are 3 persons with autism registered in this CEU.

Figure 16 – 2021' s enrollments in the Municipal Network of SP at CEU Vila Alpina in modalities: complementary activity (ATCOMP), special education partner school (CONVEE), day care, professional education (EDPROF), youth and adult education (EJA), special education (ESPEC), primary education (FUND), secondary education (MÉDIO), youth and adult literacy movement (MOVA), guidance on educational informatics (OIE), guidance in the reading room (OSL), pre-school - early childhood education (PRÉ), pro-youth (PROJ), parallel recovery (REC) and inclusion support and follow-up room (SAAI)



Source: Prepared by the authors with data from São Paulo City Hall

5. CONCLUSION

CEUs are urban facilities designed with quality architecture, installed in peripheral locations where social vulnerability has been identified and contribute to build an egalitarian society. It appears that the concern with walkability and accessibility in the implantation and availability of internal spaces has not been extended to the external spaces of the sidewalks. There are many pedestrians, including children traveling alone, in the immediate surroundings of the CEUs. The same beauty granted to internal spaces could be applied to external spaces and sidewalks, in order to allow pedestrians and people with disabilities to walk autonomously and safely on the sidewalks, instead of walking through the streets because the space that left was not designed to walk...

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