Accessibility at Bus Terminals in the Metropolitan Region of Campinas – São Paulo, Brazil

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Abstract. This article aims to evaluate ten accessibility perspectives in the infrastructure installed in the main bus terminals in the Metropolitan Region of Campinas to serve people with reduced mobility, in situations of disability, physical, visual, hearing impairment or a combination of them. The Brazilian ABNT 9050 standard was used to evaluate the terminals. The terminals were selected based on daily usability when traveling for people with disabilities. It was identified in all terminals that people with disabilities need one or more help to travel, showing that the actions taken for accessibility are not complete, but with different levels of maturity of the evaluated terminals. Through the analyzes carried out, it is possible to conclude that the installations made are more about increasing the perception of bus users without disabilities than actually facilitating accessibility for people with disabilities focused on autonomy, comfort and safety.

Keywords: Accessibility. Bus terminal. Disabled people. Monitoring.

1 Introduction

Accessibility at bus terminals has been implemented since 2013 when buses for people with physical disabilities were purchased in the region. The people who benefited most from any mobility barrier were wheelchair users. Over the years, investments in terminals, when there were any, were more focused on people with

physical disabilities, excluding people with visual and hearing impairments, those with disabilities and reduced mobility.

The selected bus terminals are the most requested in the Metropolitan Region of Campinas. The choice of dates and times were made through Telejournalism on the broadcaster EPTV in the morning newspaper Bom dia Cidade, broadcast from Monday to Friday.

The first author of this article was interviewed and invited to participate in the evaluation of nine bus terminals, six of them in the city of Campinas and the others, one each, in the cities of Sumaré, Piracicaba and Hortolândia.

Table I shows the locations, date, time and recording links, all reports were made live.

Table I: location, date, time and recording links.

Location	Date	Time collected	Link
Rua Alzira de Águiar Aranha, S/N - Jardim Santa Genebra, Campinas - SP	06/22/2023	6h05 - 7h40	https://globoplay.globo.com/v/11720474/
Rua Luiz Raphael Lot, 74 - Jardim Novo Maracana, Campinas – SP	06/20/2023	6h07 - 7h35	https://globoplay.globo.com/v/11714007/
Rua Terminal Cury, 181 - Conceicao, Campinas – SP	06/19/2023	6h00 - 7h45	https://globoplay.globo.com/v/11710508/
Avenida Armando de Salles Oliveira, 2001 - Centro, Piracicaba – SP	07/23/2023	6h10 - 7h25	https://globoplay.globo.com/v/11812245/
Avenida Senador Saraiva 651-699 - Centro Campinas – SP	06/23/2023	6h03 - 7h42	https://globoplay.globo.com/v/11723770/
Avenida Santana, s/n - Parque Ortolândia - Hortolândia – SP	07/24/2023	6h12 - 7h40	https://globoplay.globo.com/v/11815535/
Avenida Lix da Cunha, 101 - Vila Industrial, Campinas – SP	07/25/2023	6h02 - 7h43	https://globoplay.globo.com/v/11818501/
Rua Armando Frederico Renganeschi, no Jardim Cristina, Campinas – SP	06/21/2023	6h07 - 7h38	https://globoplay.globo.com/v/11717272/
Avenida Júlia Vasconcelos Bufarah - Centro, Sumaré – SP	07/22/2023	6h12 - 7h37	https://globoplay.globo.com/v/11808805/

2 The NBR9050 standard and Law 17,624/2023

NBR 8050 is a Brazilian standard that addresses accessibility issues in buildings, furniture, spaces and urban equipment. It establishes guidelines and technical criteria to ensure that people with disabilities or reduced mobility have equal access to these spaces. The standard is known as "Accessibility to buildings, furniture, spaces and urban equipment" and its main objective is to promote inclusion and equal access for all citizens.

Some of the main points covered by NBR 8050 include [1]:

Ramps: The standard establishes the appropriate dimensions for ramps, including maximum permitted inclination, minimum width and handrails.

Doors and passages: Defines criteria for doors, minimum width of passages and height of handles, ensuring the passage of wheelchairs and people with mobility difficulties.

Accessible Toilets: Specifies dimensions and requirements for accessible toilets, including grab bars, height of accessible toilets and sinks.

Tactile and visual signage: Addresses the need for adequate signage to guide people with visual or hearing impairments, including tactile floors, Braille signs and visual signs.

Accessible parking: Establishes criteria for accessible parking spaces, including dimensions, signage and appropriate location.

Internal circulation: Defines requirements for corridors, elevators, stairs and other internal circulation elements, ensuring accessibility in closed spaces.

Street furniture: Addresses issues related to banks, kiosks, public telephones and other elements present in public spaces.

NBR 8050 has been revised over the years to adapt to the needs of people with disabilities and reduced mobility, promoting inclusion and accessibility in public and private environments. It is important to consult the most recent version of the standard for up-to-date information on accessibility requirements.

Law 17,624/2023 [2] aims to encourage Municipal Administrations to develop accessibility actions, that is, that favor access to different spaces and movement for people with physical disabilities or who have some condition that reduces their mobility.

The municipalities of São Paulo State have this initiative must be awarded the "Accessibility Seal". "Accessibility guarantees the safety and physical integrity of people with disabilities or reduced mobility, thus ensuring the right to come and go.

The pillars of accessibility

The three pillars of accessibility - autonomy, comfort and safety - are fundamental to ensuring that all people, regardless of their abilities or physical conditions, have the opportunity to fully participate in society and enjoy spaces, services and products in an equitable way. These pillars are essential to promote inclusion and equal access. Let's explore each of them:

3.1 Autonomy

Autonomy refers to the ability of people to act and make decisions for themselves, without relying excessively on help or assistance.

In the context of accessibility, this implies designing environments and products in a way that allows people with disabilities or reduced mobility to carry out daily activities independently.

Examples of measures that promote autonomy include access ramps, wide and automatic doors, accessible remote controls, simple and intuitive user interfaces on electronic devices, among others.

Autonomy is crucial for people to have the power to make choices, actively participate in society and maintain their dignity [3].

3.2 Confort

Comfort concerns the physical and emotional well-being of people in an environment or when using a product or service [4].

In the context of accessibility, it is important to create environments and products that are comfortable for everyone, regardless of their special needs.

This may include consideration of factors such as ergonomics, acoustics, adequate lighting, pleasant temperature and non-slippery surfaces.

For example, a comfortable seat on public transport is essential to providing a positive experience for passengers with physical disabilities or reduced mobility.

3.3 Safety

Safety refers to protecting people from risk, injury or damage while using spaces, products or services.

For accessibility, security is fundamental to ensure that all users are protected and free from harm.

This may involve measures such as handrails on stairs and ramps, clear and visible signage, protective barriers in dangerous locations and safe evacuation in emergency situations [3].

Safety is especially important for people with disabilities, the elderly and other vulnerable populations, as it helps minimize the risk of accidents or incidents that may occur due to architectural barriers or lack of accessibility.

In short, the three pillars of accessibility - autonomy, comfort and safety - work together to create an inclusive and equitable environment for all people.

3 Applied methodology

Using NBR9050, ten evaluated perspectives were selected [1]. These are: tactile flooring in the terminal, tactile flooring around the terminal, audible warning for crossing, visual signage for crossing, speed lane for crossing, Braille for bus information and map, bathroom for wheelchair users, access corridor for wheelchair users, bus for wheelchair users and number of people with disabilities viewed in the 1.5 hour period prior to recording for the live report.

These ten evaluation perspectives were scored in each of the nine terminals using Table II classification

Table II: classification of bus terminals.

Classification of Scores	**Definition**
5	Presents in full
4	Largely presentes
3	Partially presentes
2	Presents in specific locations
1	It does not have

4 Results and discussions

In all visits, the ten perspectives were analyzed, with scores ranging from 1 to 5 for the initial nine perspectives. The last was a quantitative analysis of the number of people with disabilities identified in the 1.5 hour period preceding the recording.

The maximum score from the nine perspectives totals 45 points. In the assessment, the highest score was 30 points and the lowest was 15 points. Table III presents the perspectives.

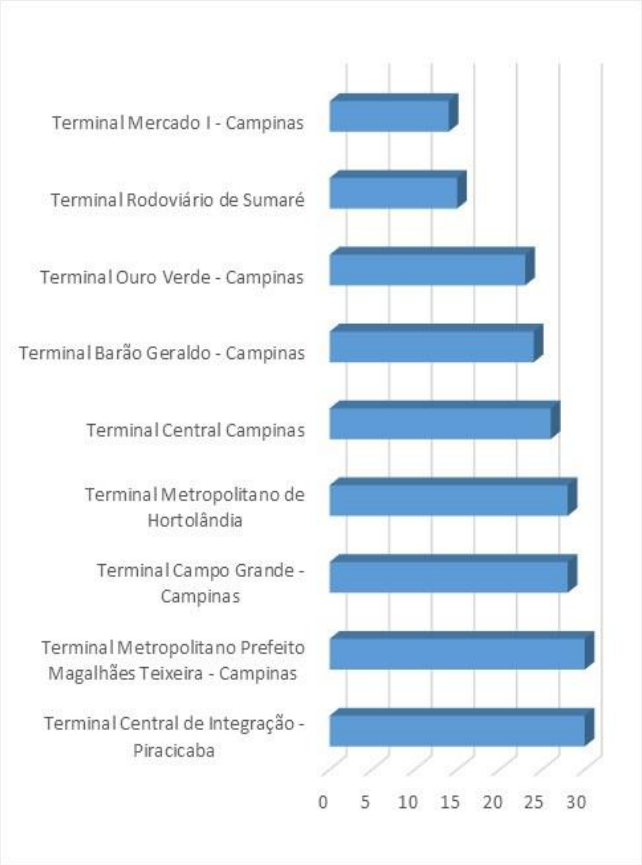
Table III: analysis of the perspectives of tactile flooring and crossing for people with physical, visual and hearing disabilities, in situations of disability and reduced mobility.

Bus terminal	Tactile floor in the terminal	Tactile flooring in the surrounding area	Audible warning for crossing	Visual signaling for crossing	Lombolane for crossings
Terminal Barão Geraldo - Campinas	2	1	1	1	1
Terminal Campo Grande - Campinas	3	1	1	1	5
Terminal Central Campinas	3	1	1	1	5
Terminal Central de Integração – Piracicaba	5	1	1	1	5
Terminal Mercado I – Campinas	1	1	1	1	1
Terminal Metropolitano de Hortolândia	2	1	1	1	5
Terminal Metropolitano Prefeito M. Teixeira - Campinas	2	2	1	1	5
Terminal Ouro Verde - Campinas	1	1	1	1	1
Terminal Rodoviário de Sumaré	1	1	1	1	1
Average per type of accessibility	**2**	**1**	**1**	**1**	**3**

Table IV: analysis of Braille perspectives for information, bathrooms, corridors, buses and number of people with disabilities witnessed during the terminal analysis period.

Bus terminal	Braille in bus information and map	Bathroom for wheelchair users	Wheelchair access corridor	Wheelchair accessible bus	Number of people with disabilities visualized in 1.5 hours of monitoring
Terminal Barão Geraldo – Campinas	1	5	5	5	2
Terminal Campo Grande - Campinas	1	5	5	5	1
Terminal Central Campinas	1	3	3	5	3
Terminal Central de Integração – Piracicaba	1	5	5	5	1
Terminal Mercado I – Campinas	1	1	1	5	1
Terminal Metropolitano de Hortolândia	1	5	5	5	2
Terminal Metropolitano Prefeito M. Teixeira – Campinas	1	5	3	5	5
Terminal Ouro Verde – Campinas	1	5	5	5	2
Terminal Rodoviário de Sumaré	1	1	1	5	2
Average per type of accessibility	**1**	**4**	**4**	**5**	**2**

Adding the ten perspectives, considering that the tenth has no limit of five points due to the quantitative analysis of in-person viewing of people with disabilities, the ranking from highest to lowest is illustrated in graph I below:



Graph1: bus terminal scores.

During visits to the terminals, it became clear that accessibility for people with visual impairments involves, in most cases, the installation of a partial tactile floor, and only in one terminal it is complete with the combination of a tactile warning floor and a directional one. In the surrounding area, none of the terminals have continuity in the external area, which represents the arrival or departure of the terminals with autonomy, comfort and safety.

At crossings internal to the bus terminal, of the nine evaluated, five presented a speed lane, which is a safety lane level with the bus boarding and disembarking platform, forcing buses to reduce speed at the crossing point for passengers.

For people with visual and/or hearing impairments, all bus terminals did not have any visual or sound signaling that would allow them to cross autonomously and safely.

The absence of Braille in all bus terminals for people with visual impairments on platforms and at local information points was also identified.

When evaluating access for wheelchair users, who are people with physical disabilities, such as bathrooms, access corridors and buses with adaptations, it was the point that came closest to accessibility requirements. Of the nine bus terminals, six of them met these requirements.

And finally, considering the time spent at the bus terminals, which was approximately 1.5 hours in each location, up to five people with some disability were seen.

Considering that according to statical census IBGE [5] in 2010, we have one person with a disability in every four in Brazil, the number of people found is far below the thousands of users who use the bus terminals daily.

Currently, the IBGE census 2023 is finalizing this analysis, but it has not been published. The tendency is for this number to be lower due to the change in methodology. The prediction is that in 2024 we will have this data more real than the previous one.

5 Conclusions

The introduction of buses with elevators to serve people with disabilities in 2013 in the Metropolitan Region of Campinas became a milestone for improving accessibility in bus terminals for people with physical disabilities.

On the other hand, other people with hearing and visual impairments continue to be completely excluded from access to bus terminals, being forced to have some help from a kind and empathetic person or to depend on a loved one to get around.

For crossings on bus terminal premises, infrastructure accessibility adaptations were made exclusively for people with physical disabilities, in situations of disability and reduced mobility.

The surroundings of the bus terminals are deficient in all those visited, and it is also necessary to design and implement accessibility on the perimeter of the bus accesses.

Regardless of IBGE census data, the number of people with disabilities found in bus terminals is small compared to the number of passengers circulating and attention from public authorities is essential for the inclusion of these people in public transport.

The current law promotes an accessibility seal, but there is no obligation on the part of the public authorities to fully assist people with disabilities. For this reason, there is greater difficulty in demanding improvement and inclusion of people in public transport.

To conclude, it is possible to state that accessibility interventions only serve a group of people with physical disabilities, excluding those with visual and/or hearing impairments.

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