Proposal of a methodology for accessibility projects on urban roads and places

Proposta de uma metodologia para projetos de acessibilidade em estradas e lugares urbanos

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ABSTRACT
A study of the current accessibility legislation was carried out in order to obtain a clear assessment of the physical aspects of an urban region, given the importance of accessible spaces for integration of the general people, based on the survey of the positive and negative points of roads and public places. From these studies, a systematization of activities was proposed to favor design interventions and corrections in accordance with the ABNT Technical Standards. The methodology is composed by identification e register files of the accessibility conditions, the analysis of post-occupation assessment carried out, postposed by the elaboration of an architectural-landscape-urban project. The main objective of eliminating architectural barriers, promoting safety and movement without interferences, in addition to optimizing of urban place use is completed.

Keywords: Accessibility, Urban places, Methodology of research.

RESUMO
Foi realizado um estudo da legislação atual de acessibilidade a fim de obter uma avaliação clara dos aspectos físicos de uma região urbana, dada a importância dos espaços acessíveis para a integração da população em geral, com base no levantamento dos pontos positivos e negativos das estradas e dos locais públicos. A partir destes estudos, foi proposta uma sistematização das atividades para favorecer intervenções e correções de
Building accessible spaces for people who cannot circulate without the assistance of a relative or friend presupposes an urban design that meets the needs of all citizens. For people with special needs, of course, but also for any citizen who has reduced mobility, whether temporary, such as pregnant women or baby carriages, or permanent, such as the elderly, people who make use of auxiliary equipment like canes, crutches, walkers, wheelchairs, or even with the help of trained dogs, in the case of the visually impaired.

Walking is the most primitive and perhaps the most widely used mode of travel in society. To move around on foot in public area, however, requires accessibility conditions in order to reach the various places in the city. Accessibility, therefore, is a citizen's right.

Based on this premise, this work proposes a methodology of identification, analysis and proper documentation, aiming at the solution of accessibility problems in streets and public places, from the analysis of the roads, sidewalks and public areas, regarding their current physical aspects (quality, barriers and devices installed in the sidewalks, pedestrian crossings in roads, signs, tree planting, etc).

To present the methodology developed, a brief approach to the theme is made in research, publications and technical norms of the Brazilian Association of Technical Norms (Associação Brasileira de Normas Técnicas - ABNT), websites and legal diplomas.

2 ACCESSIBILITY

In the last fifteen years, Brazil has undergone profound changes related to public policies for people with special needs. Federal laws were regulated in 2004 by Decree No. 5.296/2004, which establish opportunities and conditions for the development of a national policy of accessibility.

Law nº 3.919/2006, art.2 defines accessibility as "the set of access alternatives which enable the use, with safety and autonomy, of buildings; of urban places, equipment
and furniture; of transportation; and of communication systems and means by people with disabilities or reduced mobility”.

According to art.3, a person with reduced mobility is

[...] those who, not fitting into the concept of person with disability, have, for any reason, temporary or permanent, difficulty in moving, having reduced, effectively, mobility, flexibility, motor coordination and perception; fitting into this situation elderly people, children, pregnant women, nursing mothers, obese people and people with children in arms, among others.

In order to have a wider dissemination of this information, the National Secretary of Transportation and Urban Mobility (SeMob - Secretaria Nacional de Transporte e da Mobilidade Urbana) prepared, in 2004, the Brazilian Program of Urban Accessibility - Accessible Brazil (Programa Brasileiro de Acessibilidade Urbana - Brasil Acessível), with the purpose of supporting the municipal and state governments and guiding all segments of society towards an urban mobility policy which promotes social inclusion and respect to the fundamental rights of people with special needs (PcD) and the elderly (Ministério das Cidades, 2004).

In order for this accessibility program to be implemented in Brazilian municipalities, actions and instruments defined by the program were established, indicating for several foreseen actions, instruments which are necessary for their implementation (Table 1).

<table>
<thead>
<tr>
<th>Item</th>
<th>Foreseen Goals</th>
<th>Instruments for its Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Personnel Training;</td>
<td>Publication of information and training material;</td>
</tr>
<tr>
<td>2</td>
<td>Adequacy of transportation systems;</td>
<td>Organization of national and international courses and seminars;</td>
</tr>
<tr>
<td>3</td>
<td>Elimination of barriers;</td>
<td>Drafting of norms and guidelines;</td>
</tr>
<tr>
<td>4</td>
<td>Dissemination of the universal design concept in the planning of transportation systems and public equipment;</td>
<td>Promotion of targeted research and development;</td>
</tr>
<tr>
<td>5</td>
<td>Stimulating the integration of government actions;</td>
<td>Implementation of database;</td>
</tr>
<tr>
<td>6</td>
<td>Sensitization of society;</td>
<td>Encouraging the implementation of Municipal Mobility Programs;</td>
</tr>
<tr>
<td>7</td>
<td>Stimulus to the organization of PcD’s;</td>
<td>Creation of new funding sources;</td>
</tr>
<tr>
<td>8</td>
<td>Stimulating technological development;</td>
<td>Raising of public awareness to good policies and practices;</td>
</tr>
</tbody>
</table>

Source: Ministério das Cidades, 2004

In order to implement the actions foreseen in the program, SeMob elaborated a technical material that covers the whole issue of accessibility. This material is composed
of six booklets that are available in the website of the Ministry of the Cities (www.cidades.gov.br), presented in Table 2.

Table 2 – Quadro-resumo com os principais conteúdos abordados em cada caderno do Programa Brasil Acessível

<table>
<thead>
<tr>
<th>Booklet 1</th>
<th>Appropriate service for people with disabilities and mobility restrictions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booklet 2</td>
<td>Building the accessible city</td>
</tr>
<tr>
<td>Booklet 3</td>
<td>Implementation of decree n 5.296/04</td>
</tr>
<tr>
<td>Booklet 4</td>
<td>Implementation of municipal policies of accessibility</td>
</tr>
<tr>
<td>Booklet 5</td>
<td>Implementation of accessible transportation systems</td>
</tr>
<tr>
<td>Booklet 6</td>
<td>Good practices</td>
</tr>
</tbody>
</table>

Source: Ministério das Cidades, 2004

Booklet 2 (Table 2) contains the actions that refer to the attributions of professionals in the areas of Architecture and Urbanism and Civil Engineering. Basically, the content is

[...] aimed at professionals in the field of urban design, urban furnishing and implementation of projects and works in public places, as well as in buildings for collective use, public or private. It focuses on public circulation areas and pedestrian needs, with emphasis on the disabled and the elderly. It presents, through examples, how not to build new barriers in urban places and suggestions for correct projects and interventions, in compliance with Decree 5.296/04 and Standard NBR 9050:2004.

According to the NBR 9050 Standard (ABNT, 2004), an accessible space is one whose furniture, element or urban equipment is within reach and can be experienced by any person, especially those with reduced mobility.

3 UNIVERSAL DESIGN

It was created in 1963, by a commission in Washington - USA, the "Barrier-Free Design", whose objective was to discuss the elimination of barriers in the projects of urban areas, equipment and buildings, being expanded and called Universal Design.

Only in 1980 did the debate on the theme start in Brazil, with the aim of raising the awareness of professionals in the construction area, such as architects, urban planners and engineers. In 1985, the Brazilian Association of Technical Standards (ABNT) created the first technical standard on accessibility, today called NBR 9050: "Accessibility to buildings, furniture, urban places and equipment for people with disabilities" (ABNT, 1985, 1994; CARDOSO, 1996) and in 2004 the publication of Federal Decree 5.296 gave Universal Design the force of law (ALVES et al., 2005).
The Decree defines the "Universal Design" as a "conception of spaces, artifacts and products that aim to meet simultaneously all people, with different anthropometric and sensory characteristics, in an autonomous, safe and comfortable way, constituting the elements or solutions that compose the accessibility".

According to ABNT's Standard NBR 9050/2004 Universal Design is "that which aims to meet the greatest possible range of variations in anthropometric and sensory characteristics of the population" (ABNT, 2004).

In projects for public areas it is essential to apply the Universal Design, which means the planning and development of barrier-free spaces that promote respect for collective interests, the various human needs and the functional relationship between all elements that make up the urban environment, without the need for adaptation or development of specific projects for people with special needs.

In order to standardize the application of the Universal Design, which is globally adopted in any full accessibility program, in the 90's the American Ron Mace, who created the terminology Universal Design, established guidelines for this important concept. The guidelines were compiled in the Manual of Universal Design of the Government of São Paulo1, and a summary of the manual is presented in Table 3.

<table>
<thead>
<tr>
<th>Directive</th>
<th>Specific Course of Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equitable Use</td>
<td>Propose spaces, objects and products that can be used by users with different abilities and for all users;</td>
</tr>
<tr>
<td>Flexible Use</td>
<td>Create environments or building systems that can meet the needs of users with different abilities and diverse preferences, allowing adaptability, adaptations and transformations;</td>
</tr>
<tr>
<td>Simple and intuitive use</td>
<td>Allow easy understanding and apprehension of space, regardless of the user's experience, degree of knowledge, language ability or level of concentration;</td>
</tr>
<tr>
<td>Easy-to-understand information</td>
<td>Make available forms and objects of communication clearly containing the essential information, making it easy to use the space or equipment;</td>
</tr>
<tr>
<td>Error tolerance (security)</td>
<td>Consider safety in the design of environments and the choice of materials to minimize the risk of accidents;</td>
</tr>
<tr>
<td>Minimal physical effort</td>
<td>Dimension elements and equipment so that they can be used efficiently, safely, comfortably and with minimum effort or fatigue;</td>
</tr>
<tr>
<td>Place dimensioning for comprehensive access and use</td>
<td>Allow access for all users, enabling visual range of environments and products to all users, sitting or standing, and comfortable use for ergonomic variations;</td>
</tr>
</tbody>
</table>

Source: Governo de São Paulo, 2009

1 This manual is no longer available at the referenced address, these were eliminated by the São Paulo State Government; however, the authors keep the citation and reference for the importance of the material and for the fact that it was used in the research.
The Manual seeks to cover all the parameters involved in the processes of architectural creation and construction in order to allow quality access, safety, and comfort to the people who inhabit an environment. The consideration of these concepts and guidelines by the architect, urban planner, and civil engineer in the planning and execution of their projects will result in a work that is complete in its primary functions, without primary additional cost or subsequent adaptation.

As far as roads and public places are concerned, for the elaboration of universal urban projects, in principle preference should be given to the hierarchical circulation system that favors pedestrians, considering the location and size of buildings, public equipment and urban furniture, in order to offer easy access and use, providing a free and unimpeded circulation for people.

Residential neighborhoods and commercial centers, with high circulation of people on foot between homes or commercial establishments, are the urban regions of greatest need for planning considering the aspects mentioned, because they travel short and medium distances without the need for vehicle transportation.

4 ARCHITECTURAL BARRIERS

Any and all access difficulties, related to urban constructions or buildings, which impede the citizen's right to come and go are classified as Architectural Barriers. This impediment to access is not restricted only to wheelchair users, but also to those people with temporary or permanent limitations such as the elderly, pregnant women, the visually or hearing impaired.

Accessibility barriers are considered to be the biggest problem for people with motor difficulties, which accentuate their limitations and prevent the expression of their abilities, as well as access to all the means of their lives (FREGOLENTE, 2008).

According to the NBR 9050/2004 standard from ABNT, architectural, urban or environmental barrier is "Any natural, installed or built element that prevents the approach, transfer or circulation in space, furniture or urban equipment”.

Law No. 10.098, of December 19, 2000, defines 'barriers' as any obstacle or hindrance which limits or prevents access to freedom of movement and safe circulation for people, and classifies them into four types of barriers (Table 4).
Table 4 – Architectural Barriers

<table>
<thead>
<tr>
<th>Classification</th>
<th>Places</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural Barriers in Urban Areas</td>
<td>those existing on public roads and places for public use;</td>
</tr>
<tr>
<td>Architectural Barriers in Buildings</td>
<td>those existing inside public and private buildings;</td>
</tr>
<tr>
<td>Architectural Barriers in Transportation</td>
<td>those existing in means of transportation;</td>
</tr>
<tr>
<td>Architectural Barriers in Communications</td>
<td>any obstacle or hindrance that makes it difficult or impossible to</td>
</tr>
<tr>
<td></td>
<td>express or receive messages through the media or communication systems,</td>
</tr>
<tr>
<td></td>
<td>whether mass or not;</td>
</tr>
</tbody>
</table>

Source: ABNT, 2004

The 'urban architectural barriers' are constituted by: crossings without signaling; curb guides without lowering; streets, sidewalks and walks with irregular paving or sidewalk; unevenness of the floor without access to ramps, ramps with incorrect declivity, absence of access ramps in public and private places; existence of stairs, which make it impossible for some people to move around, or steps, which make it impossible to move around or cause falls; inadequate parking places; mailboxes and telephone booths poorly positioned, poles, benches, advertisements, garbage cans, flower pots, planters, newsstands, traffic signs and water meters poorly positioned; slippery floors, with holes or even interspersed with grass; very narrow paths; very high guides and without access ramps; public restrooms without adaptation; vegetation advancing on the sidewalk; ramps for access to the garage that enter the sidewalks forming impassable steps for wheelchairs; etc. (ALVES and SOLEDADE, 2005).

The existence of physical barriers is usually the result of negligence and lack of enforcement in the application of existing laws by the government at all levels.

5 PUBLIC ROADS AND PLACES

The urban streets and public places build the cities and house a multitude of activities of society, from a simple walk to collective artistic or political events. These places must be conceived taking into account the Universal Design, in order to ensure the principles of project and implementation of mobility policies in urban design.

These urban policies validate interventions associated with development and planning policies, with the support of technical and infrastructure solutions, institutional, economic and social solutions, in order to establish a democratic and sustainable use of cities, which refers to the treatment of public roads, enabling accessibility and circulation conditions with safety and autonomy for all citizens, regardless of their physical, social and economic condition. It should mainly contribute to give less priority to the
automobile, strengthen the pedestrian's right to come and go and prioritize public mass transportation (BITTENCOURT et al., 2004).

The guarantee of mobility and accessibility, as determined by the Brazilian Association of Technical Standards (ABNT) and municipal legislation, depends on the complete elimination of architectural barriers present in the urban design. On public roads, these obstacles occur mainly in the circulation area and at signalized crossings, and in the installation and design of furniture. The urban or landscape project must adequately treat each of these elements, by means of their integration in a system which includes the subsoil and the drainage systems, the guides, the free circulation and crossing lane, the equipment rental areas, the urban furniture, the lighting and signaling, the vegetation and the accesses to the buildings; these are the guidelines of the Permanent Commission for Accessibility (CPA) of the Secretary of Housing and Urban Development of the Municipality of São Paulo (SEHAB) (CPA-SEHAB, 2003a).

In order to have an integration of proposals, plans, goods and citizens who compose the road and the public place, the urban design, qualified by the concept of accessibility and universal design, shows itself as a strong instrument of effectiveness for the construction of the city in an orderly, cohesive and mainly accessible way to all its users and goods (SILVA, 2004; BARROS, 2006).

About the urbanization of public areas of common use of the people, Law 3.919/2006, art. 28, was instituted in order to guarantee free transit to all, including people with disabilities or reduced mobility (ALVES and SANDRINI, 2008).

6 ACCESSIBLE ROUTES

According to the NBR 9050 Standard (ABNT, 2004, 2015, 2020), an "accessible route" is the continuous, unobstructed and signalized path, which connects the environments, external or internal spaces and buildings, and that can be used autonomously and safely by all people, including those with disabilities". The external accessible route may incorporate component elements, which may be grouped into three categories or functions, namely, free lane, access lanes or means and service lane or urban furniture, defined in Booklet 5 from the National Secretary of Transportation and Urban Mobility (MINISTRY OF CITIES, 2004).
7 COMPONENT ELEMENTS

7.1 FREE LANE

Free lane is the lane of the sidewalk intended exclusively for the free movement of pedestrians, unobstructed of urban furniture and equipment and other permanent or temporary obstacles. It is also destined to the implementation of urban furniture, vegetation, signaling and access lanes, providing a safe environment for mobility. It must meet some attributes: regular, firm and non-slip surface, adequate width, spatial quality and visibility, safety, continuity, socializing place, landscape design.

7.2 ACCESS LANE

Access lane is intended for access to other existing spaces along the public road, the buildings and establishments, equipment, various areas and crosswalks, giving free passage to those who follow the free lane. This lane is used as a short stay place, with no specification of maximum or minimum width, and contains auxiliary elements such as curb ramps or access ramps, pedestrian crosswalks, among others.

7.3 CROSSING LANE

According to the NBR 9050 standard (ABNT, 2004), "pedestrian crossing lane": A sign across the roadways for vehicles, destined to order and indicate the priority movement for pedestrians to cross the roadway, according to the Brazilian Traffic Code.

7.4 SERVICE BANNER OR STREET FURNITURE

It is a strip intended for the implementation of urban furniture and other elements authorized by the public authority. These elements include planters, benches, garbage cans, public telephones, newspaper stands, bus shelters, mailboxes, traffic signs, utility inspection boxes, lamp posts, etc.

The implementation of street furniture should be attentive to information such as materials, design, functionality, and so as not to interfere with the free lane.

7.5 VEGETATION

Preserving, designing, and redeveloping wooded places results in increased soil permeability and contributes to air quality; however, the planting of trees on sidewalks must allow ample visibility and be located on the furniture strip, in the form of flowerbeds, strips, or draining floors, ensuring soil permeability.
8 PROPOSED METHODOLOGY

The methodology proposed here was developed to evaluate the conditions of the urban region analyzed and was based on the post-occupancy evaluation methodology introduced by Ornstein (1992), in which a model is elaborated to systematize the evaluation of accessibility in built environments, emphasizing the needs of individuals with reduced mobility and communication difficulties. Ornstein's work (1992) indicates tools for research, data collection and evaluation (ALVES et al., 2003).

In the evaluation process, four basic stages of activities are proposed, namely, investigation, identification and evaluation, documentation and project elaboration.

i. Investigation

In this stage of investigation, a preliminary reconnaissance of the region must be done, in order to know the physical, geographical, topographical and socio-economic characteristics.

With the physical characteristics the identified: delimitations of the region registered in the city hall; the maintenance or degradation of the natural habitat; the impermeabilization of the soil; the location of water courses, geographical and topographical accidents; the predominant type of soil; and the degree of neighborhood interference with surrounding regions.

From the socio-economic point of view, it is important to know the forms and dimensions of occupation, the degrees of occupation, the location of blocks where public equipment is concentrated (such as health centers, schools, day-care centers, squares), commercial establishments (such as markets and shops in general, banks, pharmacies, post offices), the points of greatest traffic in the region, both the roads with the greatest flow of vehicles and the areas with the greatest flow of pedestrians, the dimensions of roads and sidewalks, the quality of sidewalk and floors, barriers and obstacles present. This information is important for the classification of the region from the strategic point of view of the municipality's master plan.

Subsequently, an on-site investigation must be carried out in several observation points of interest, with the evaluator remaining in different periods throughout the day, observing the general circulation, identifying peak hours and off-peak hours, in order to identify the difficulties of light or heavy vehicle traffic (trucks and buses), and pedestrian
displacement, on sidewalks or at road crossings. Other information can be obtained from the municipality's traffic sector.

Sites identified as precarious or critical are chosen, in an attempt to classify them by items, such as those with a higher incidence of problematic events, complex geometry and topography, or with an intricate organization/concentration of traffic.

The permanence in the study sites must make possible the photographic identification and periods of occurrence, the dimensioning of the places and the witnessing of critical or risk situations with vehicle and pedestrian traffic. The investigation period can be defined according to the number of sites and the variations of events, and should allow the collection of data and sufficient documentation for the preparation of the final project of proposals and adjustments.

### ii. Identification and evaluation

In the investigation stage, the identification of precarious or critical points and their characteristics will provide the sequence for the evaluation stage of the sites individually and the influences or interferences in adjacent sites, considering the interconnections by roads or geographic accidents.

The professional evaluation to be done with the identification of the critical points should subsidize the elaboration of a simple and objective questionnaire, to collect the opinions of three groups of characters: a) the region's population, among residents, local businesses and neighborhood representatives; b) urban bus drivers; and c) the passers-by, local and from another region. The responses of the people who live in the region or neighborhood should seek information about their difficulties and daily needs. The answers given by those who pass through the region will provide comparisons of the local characteristics with those of their places of coexistence.

With the application of the questionnaires (survey), a qualitative analysis is obtained, with a statistically safe result, seeking to diversify and identify personal characteristics in age, education, and occupation. A classification of people's representation and interest must be carried out, as well as the relationship of the public consulted with the spaces and passages.

The questions must address aspects of circulation through the region (vehicles and pedestrians), of perception regarding the environment and comfort (nature, leisure and pollution) and of utilities (public and commercial equipment). And also, issues related to
accessibility and circulation of people with locomotor difficulties and people with disabilities through these areas and environments.

iii. Documentation

The documentation must be carried out concomitantly with the research stage and must be composed of maps and official documents, as well as classification of the region and of the propositions of the municipal master plan, photos of the precarious or critical points of accessibility and of the problems that were found in these places, including squares and plots of land, in addition to the questionnaires answered by the local characters.

Another relevant question regarding the aspect of accessibility and locomotion, especially on the streets, is the state of conservation and the way the sidewalks were individually designed, the unevenness and obstacles that hinder or completely prevent the access of people with disabilities, the elderly, and even pedestrians with temporarily reduced mobility.

Two witnessing possibilities are necessary in this aspect: a) accompanying people on their usual routes, trying to diversify their characteristics: elderly people, mothers with child carriages or small children, groups of students, large and small vehicles; b) accompanying people with some mobility difficulty on their routes (walkthrough), by the research team or indicated by the public consulted.

After this systematization of data collection, the documentation of the material, both photographic and consulted or experienced, will subsidize the preparation of proposals for improvements and adaptations for each place. The documentation must be done digitally by applications that allow three-dimensional and realistic visualization.

iv. Elaboration of the project

The project for adequacy of roads and public places in the evaluated area must follow the items presented in the requirements of Urban Architectural Barriers and Architectural Barriers in Buildings, according to the versions of Standard NBR 9050, 2004, 2015 and 2020, as governed by current legislation and as guided by various publications cited in the items of context and rationale. There must also be agreement with government policies and programs, federal, state, and municipal.
Complementary projects, such as urban and landscape planning for the revitalization of public places, can be incorporated into the accessibility project. All existing information must be sought regarding projects and works previously carried out and that can be incorporated. The aim is the re-socialization of local population, promoting leisure, sports, and coexistence, with the demarcation of differentiated places by function and by age of users, duly identified. The spaces must provide facilities and continuous procedures for security, maintenance, and cleaning of the spaces, buildings, and equipment.

Thus, the final project will contain documents and components that initially contain the results of documentary and field research, obtained from the investigation and identification stages. The studies of the possibilities of adequacy or correction of the problems identified in the study sites, with registration in a technical report containing normative and manual references, are destined in another volume. A report must be included with the justifications and implementation costs for each option raised, both from the economic and execution point of view and from the final architectural and public acceptance point of view.

Table 5 presents the work stages and corresponding actions of the proposed methodology.

<table>
<thead>
<tr>
<th>Stages</th>
<th>Foreseen Actions</th>
<th>Instruments and documentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. research</td>
<td>• staff training</td>
<td>• Technical Team</td>
</tr>
<tr>
<td></td>
<td>• data collection from municipal institutions</td>
<td>• Literature and literature search</td>
</tr>
<tr>
<td></td>
<td>• <em>in loco</em> research of places and situations</td>
<td>• Government documentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Field research documentation</td>
</tr>
<tr>
<td>ii. identification</td>
<td>• Studies and identification of critical points</td>
<td>• Technical studies and measurements</td>
</tr>
<tr>
<td>and assessment</td>
<td>• Technical evaluation</td>
<td>• Evaluation according to standards and manuals</td>
</tr>
<tr>
<td></td>
<td>• Collection of users' opinions</td>
<td>• Questionnaires</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Path-follow-up reports</td>
</tr>
<tr>
<td>iii. documentation</td>
<td>• Cataloguing of documentation, data maps and technical reports</td>
<td>• Data and image manipulation software and applications</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Documentary files</td>
</tr>
<tr>
<td>iv. drafting of project</td>
<td>• Proposals for accessibility adequacy of study sites and complementary adequacy</td>
<td>• Geometric design of study sites with equipment positioning</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Detailed design with dimensions and signaling</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Descriptive memorial of the proposed adaptations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Report of justifications and implementation costs</td>
</tr>
</tbody>
</table>

Source: authors
9 FINAL CONSIDERATIONS

The mandatory elimination of architectural barriers in buildings, urban places, and roads brings the need for adaptation through corresponding architectural projects, in order to promote more accessible spaces. The process of analysis and project proposition requires a systematization for the professional work to be carried out correctly.

The technical orientations contained in the consecutive versions of the NBR 9050 norm have been altered, in such a way that several pieces of information have been eliminated, leaving the manuals and guides elaborated by the public sector, for the maintenance of the registers. The governmental bodies, federal, state and municipal, change their legislation.

This work, based on a specific and differentiated evaluation methodology, aimed to gather and register some information found in disperse works for the evaluation and proposal of adequacy of equipment, furniture, public places and roads, with a systematized research proposal.

From this study, a systematization of activities is proposed to favor projectual interventions according to the ABNT Technical Standards. The proposed methodology was composed of a survey and records of the existing accessibility conditions, as subsidies for the post-occupation evaluation of the region and the subsequent analysis and elaboration of architectural-landscape-urban adequacy projects for the place, in order to eliminate the architectural barriers and to promote safe circulation without interferences, and the optimization of the use and occupation of the analyzed space.

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