

The Accessibility Chain: a Challenge and an Opportunity for Cities and People with Disabilities

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Abstract

Barcelona has been striving to become a completely accessible city with fully guaranteed rights for people with disabilities for over 40 years. In 2008, the Municipal Council announced its commitment to the pursuit of the rights set forth in the UNCRPD. This was followed in 2017 by the City Council's approval of a Government Measure to draw up a universal Accessibility Plan for the city (2018-2026) in line with SDG 11 on sustainable cities and with milestones 11.3 and 11.2 of the 2030 Agenda. The universal Accessibility Plan started with an initial diagnosis phase and an analysis of the degree of physical, sensory and cognitive accessibility of over 636 municipal facilities, the entire public transport network and over 1,013 km of public highway in 61 of the city's neighbourhoods.

In 2020, having obtained the data and in the middle of the pandemic, the City Council was forced to redesign its roadmap, setting in motion a number of cross-cutting actions for the city focused on accessibility and caring for people with disabilities in order to ensure greater health security for everyone. Factors such as social distancing, new safety signs or even the use of masks emerged as new barriers that needed to be addressed to ensure no one was being left behind.

Keywords: accessibility, blindness, sustainable cities, labour market inclusion, pandemic, visual disability

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Barcelona has been working to become a completely accessible city where the rights of people with disabilities are fully guaranteed for over 40 years. Helping the city to achieve this is the Municipal Institute for People with Disabilities¹, an independent body that works with every area of the City Council to promote accessibility and inclusion in the city's public policies. In 2008, following its initial Accessibility Plan (1997-2006) which focused on accessibility in the city's streets and public spaces, the City Council reaffirmed its commitment to guaranteeing the rights set out in the United Nations' Convention on the Rights of Persons with Disabilities (CRPD). More recently (in 2017) it approved a Government Measure for drafting the 2018-2026 Universal Accessibility Plan for Barcelona (PAUB in Catalan), which will deal with improving physical, communication and cognitive accessibility in a wide range of venues and facilities.

The Government Measure, inspired by Sustainable Development Goal 11 "Sustainable cities and communities" and targets 11.2 and 11.3 of the 2030 Agenda², established a three-phase implementation of the new Accessibility Plan: a first phase diagnosing the degree of accessibility of the various public spaces and services; a second, participatory phase, aimed at reaching consensus on the best accessibility solutions to be implemented in the city, and third and final phase, where the Plan will be implemented with the requisite budget.

In this article we will run through the various stages of the Accessibility Plan's diagnostic phase, which was carried out between 2017 and 2021 (in facility interiors, public streets and squares, green spaces and play areas), identify the unique projects implemented with over 100 people with disabilities hired by the City Council and highlight the role of the accessibility chain as the backbone of the various initiatives carried out in the city. At the same time, the article also presents an innovative project driven by the City Council whose main goal is to address accessibility needs that persons who are blind and partially sighted have in getting around the city and enjoying developed environments on an equal basis.

Accessibility to facility interiors and services

First of all, once the Government Measure for drafting the Accessibility Plan had been approved, the first stage of the diagnostic phase was carried out between 2017 and 2019. This included analysing the degree of physical, sensory and cognitive accessibility

¹ Barcelona City Council has an autonomous body, the Municipal Institute of People with Disabilities (IMPD), whose mission is to promote activities and services accessible to people with disabilities. To do this, the IMPD staff work together with all the areas and districts of the city administration to guarantee that citizens with disabilities have access to services, activities and public spaces, meaning both the chance to move freely and the possibility of enjoying these resources.

IMPD's governing board is composed 50% of elected politicians and 50% of people with disabilities, elected by citizens with disabilities every four years. With a staff of 70 workers, the IMPD strategy consists of mainstreaming accessibility and inclusion throughout the city administration. It also provides some special resources and services for people with disabilities: Early Child Care Development Centre, Labour Inclusion Service, Independent Living Programme and Information Office.

The IMPD is currently leading the 2018-2026 Accessibility Plan, which has three stages: 1. Diagnosing the level of accessibility in various city services; 2. Drawing up solutions for improving accessibility with the participation of people with disabilities; and 3. Implementing the solutions adopted in coordination with the different municipal areas involved. More information available:

<https://ajuntament.barcelona.cat/accessible/ca/impd/historia>

² Sustainable Development Goal 11: <https://sdgs.un.org/goals/goal11>

of 636 municipal facilities and services (social services centres, sports centres, citizen help and information offices, community centres, primary health care centres, markets, libraries, universities, cinemas, restaurants and hotels), the entire public transport system (metro, buses, trams and trains) and 60 municipal websites.

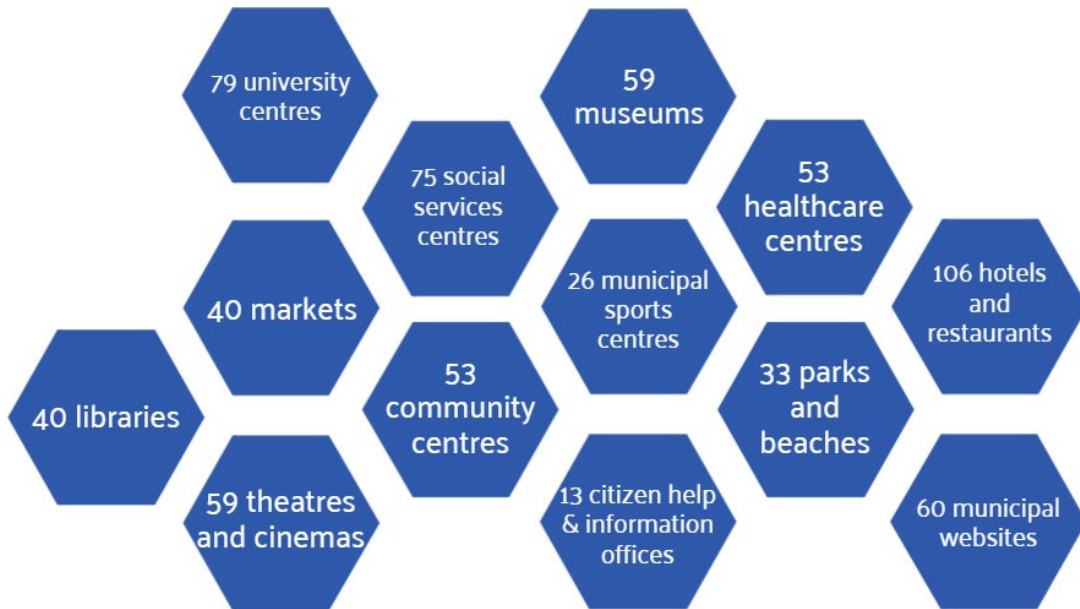


Figure 1. Facilities and services analysed during the Accessibility Plan diagnostic phase.

This initial field work was carried out by a working team of 40 people with disabilities, who visited the facilities with questionnaires to gather all the data needed to determine the level of accessibility of the environment, access points, public assistance point, horizontal and vertical mobility, access to the facilities' hygiene services and their various spaces (offices, auditoriums, changing rooms, etc.). So, between 2017 and 2019, they accurately recorded data such as the distance from each facility to the nearest public transport point; the presence of nearby parking places for people with reduced mobility; door and corridor width; the presence of steps; ramp gradients; the presence of tactile paving, dual-height counters/desks, communication-facilitating features (touch maps, materials in Braille, signage with pictograms, magnetic loops); the level of lighting, accessibility of lifts and toilettes.

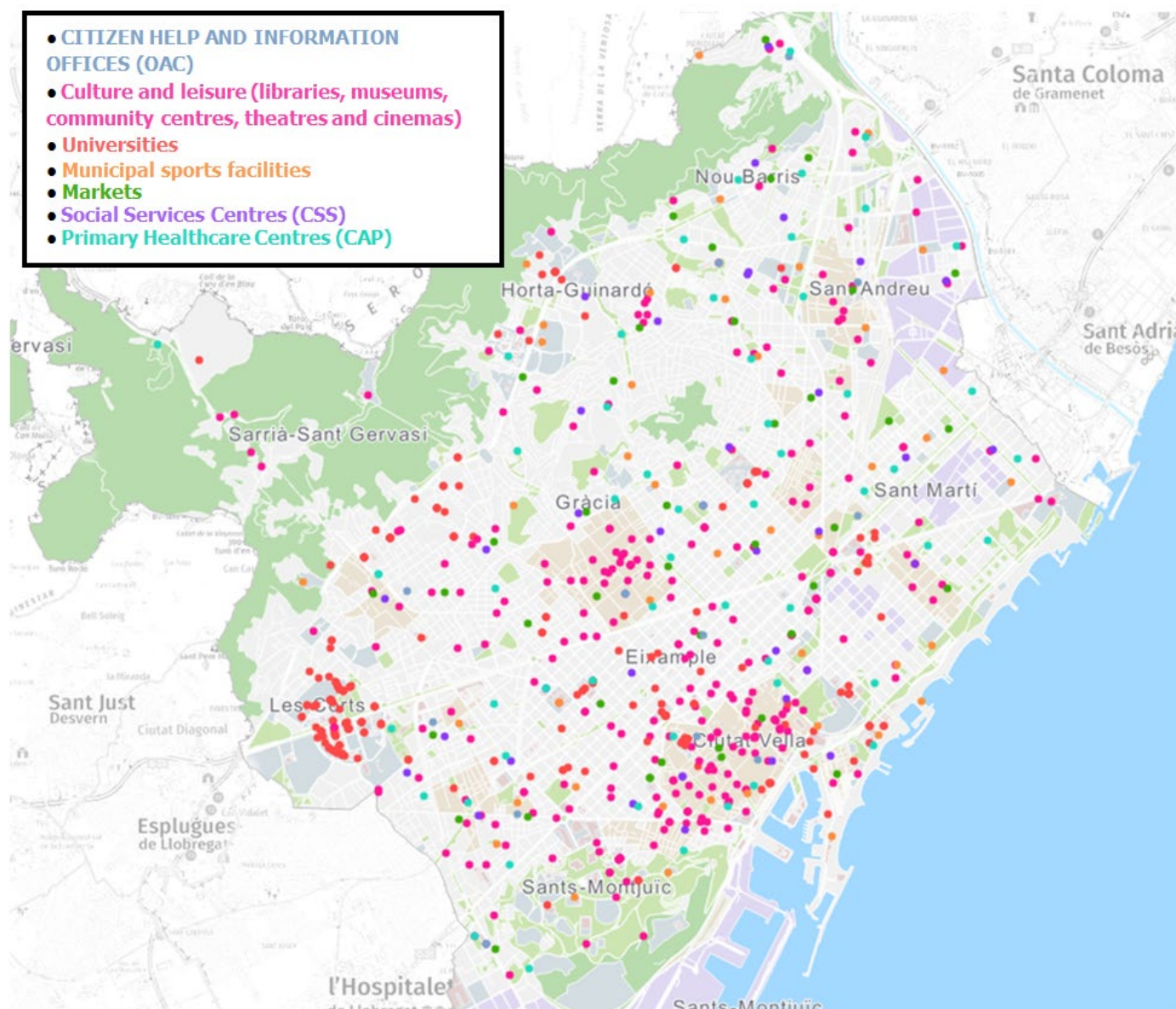


Figure 2. Map of Barcelona with a sample of the facilities analysed (from BCN Street map: <https://w33.bcn.cat/plano/BCN/ca/>)

That way a map of the city was compiled from an accessibility perspective. By mapping the data on accessibility, a clearer picture with the challenges could be identified for improving the future, which will certainly depend on focusing our efforts on communication and cognitive accessibility.



Figure 3. Dual-height reception desk at the Ciutat Vella Citizen Help and Information Office (Diagnosis PAUB 2017-2018, IMPD).

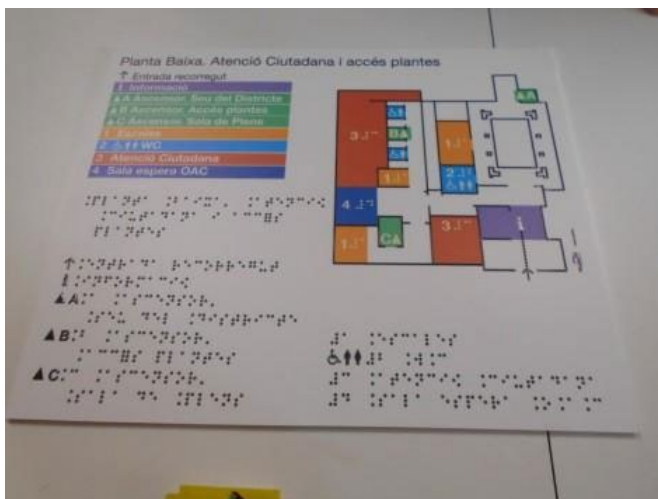


Figure 4. Tactile floor plan with Braille at Les Corts Citizen Help and Information Office (Diagnosis PAUB 2017-2018, IMPD).



Figure 5. Accessibility web at Citizen Help and Information Offices (Diagnosis PAUB 2017-2018, IMPD).

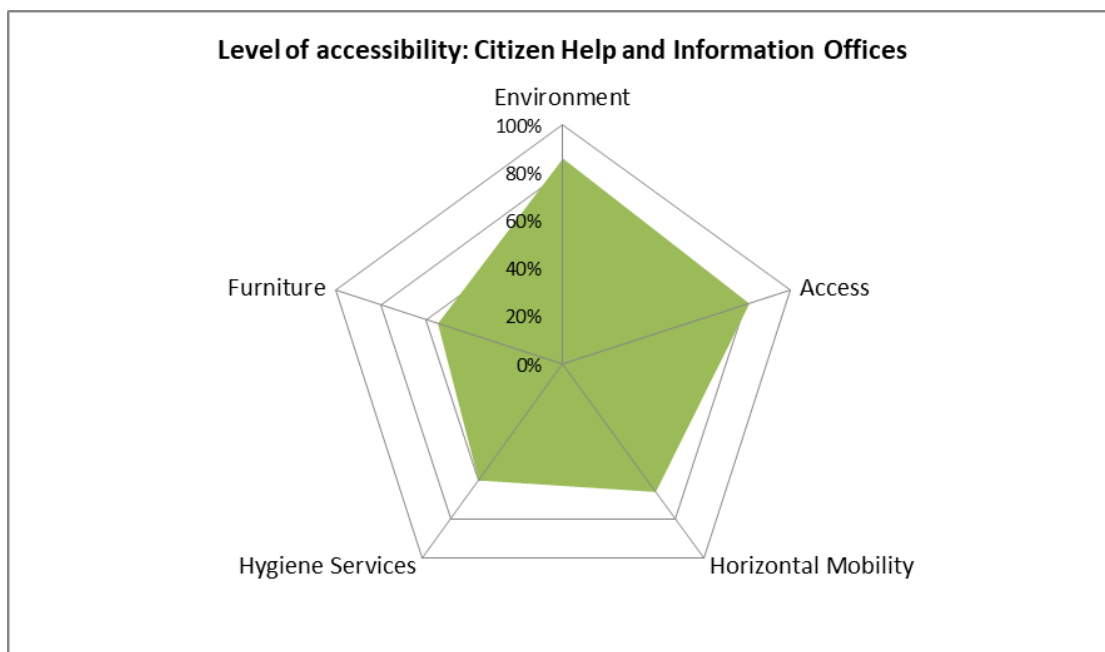


Figure 6. Radial accessibility-analysis chart of Barcelona's Citizen Help and Information Offices. (Diagnosi PAUB 2017-2018, IMPD).

Accessibility of the public highway

In parallel with the facility accessibility analysis, a public highway accessibility analysis was started between 2017 and 2021, during which more than 1,000 km of streets and squares were covered in the 73 city's neighbourhoods. Two working teams with training in architecture and building were used to collect and group the data. Those professionals collected accurate data on accessibility and grouped it under 9 headings (the state of paving, slopes, the presence of obstacles on accessible pedestrian routes, pavement width, dropped kerbs at crossing points, parking places for people with reduced mobility, changes in ground level, forms of protection – with railings and handrails– and the presence and correct layout of tactile paving). All this information was entered into Barcelona's Geographical Information System, to ensure access to updated data for every technical team in the city's neighbourhoods and districts, and to guarantee that the investments over the coming years are based on detected needs that can be established as priorities.



Figure 7. Accessibility parameters in diagnosing the Public Highway (Diagnosis PAUB 2017-2018, IMPD).

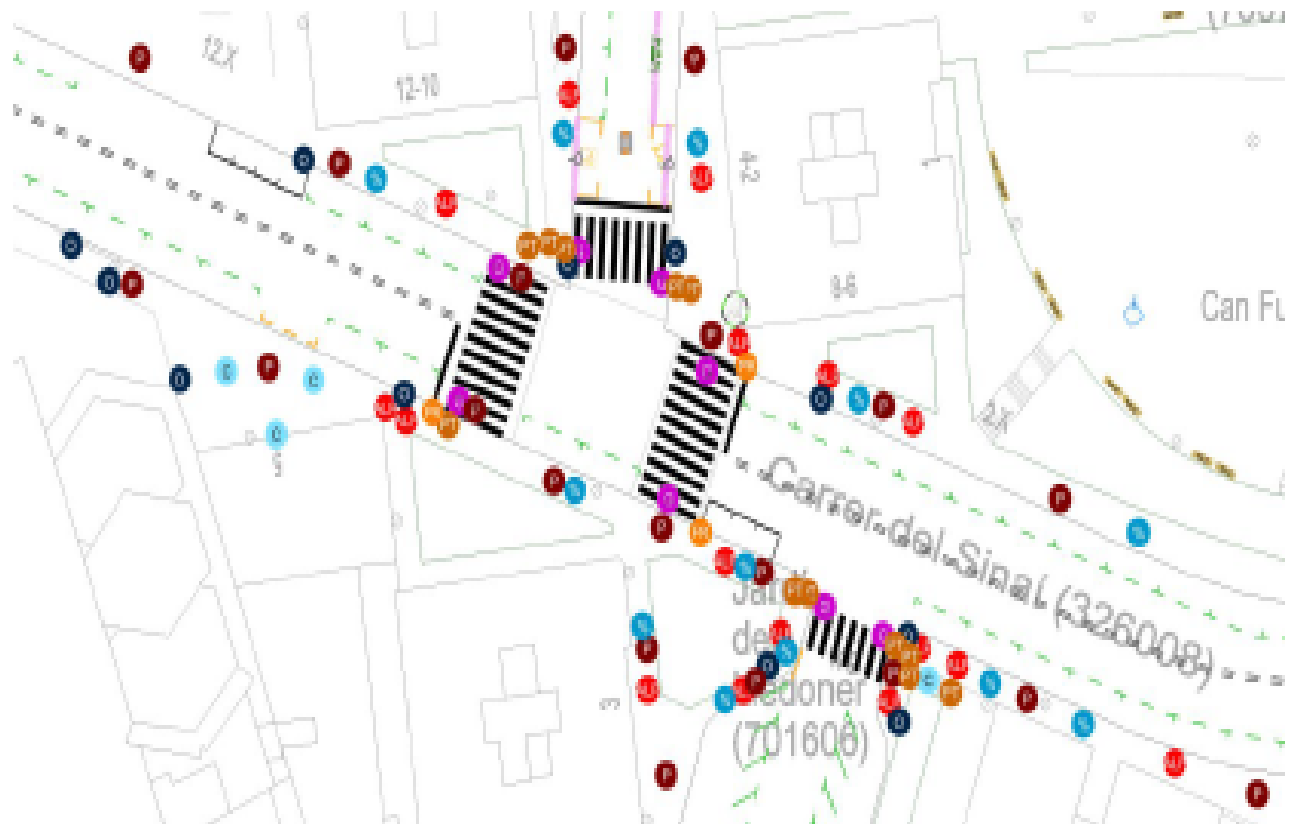


Figure 8. Street plan with various public highway analysis parameters. Image extracted from the InCa Geographical Information System (Diagnosis PAUB 2018-2021, IMPD).

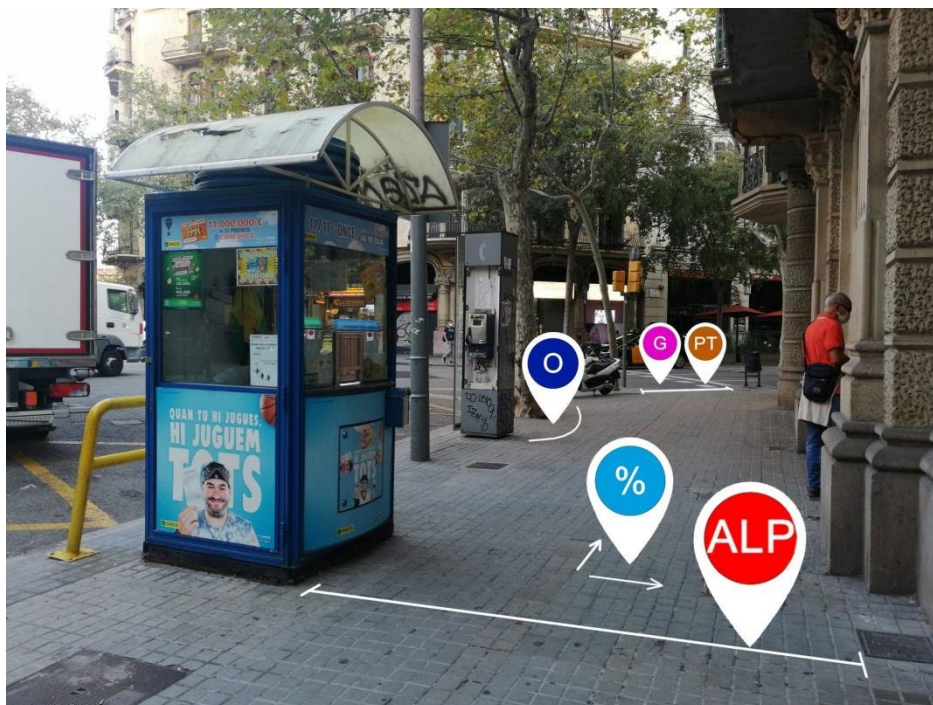


Figure 9. Example of the accessibility features analysed in a street section.

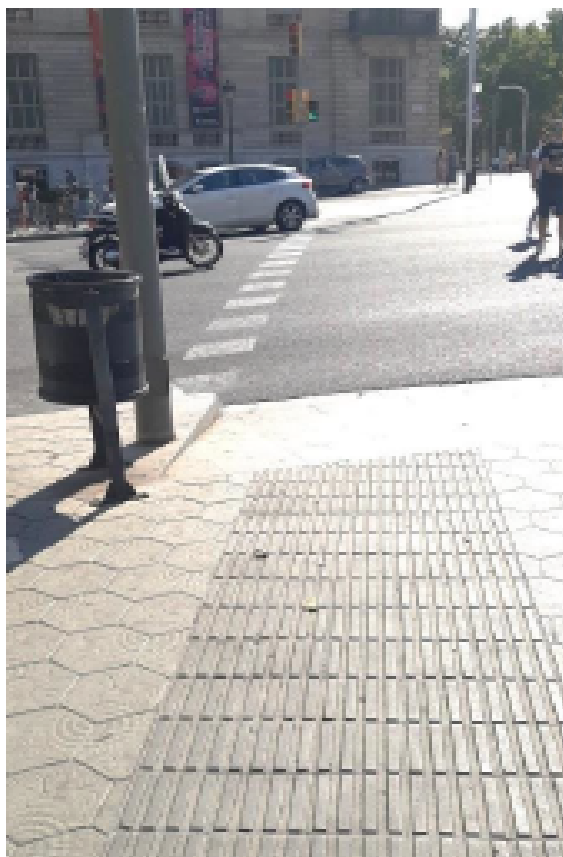


Figure 10. Directional tactile paving on Passeig de Gràcia (Diagnosis PAUB 2021, IMPD)

Accessibility to open spaces

After the outbreak of the pandemic in 2020, the City Council was compelled to redesign its roadmap in response to the health emergency. This led to the launch of a series of cross-cutting city initiatives with a focus on accessibility and assistance for people with disabilities, to ensure greater health safety for everyone. The Accessibility Plan had to be adapted to the new needs appearing, since factors such as social distancing, new safety signage and use of masks became new barriers that needed to be tackled, to prevent anyone from being left behind. These circumstances prompted the City Council to adopt specific measures around the Plan's new diagnostic stage. On the one hand, they made recommendations in relation to accessibility and safety in the context of the pandemic³. On the other hand, they proposed a series of initiatives to be implemented in 2021, which are explained below. The study of accessibility in open spaces, employing people with disabilities and promoting communication accessibility was meant to become the working framework in the new crisis context the city was going through.

It was decided to end the Plan's diagnostic phase by incorporating the collection and analysis of accessibility to outdoor environments, such as parks, children's play areas, green zones and beaches. Since the field work had to be done outdoors, the safety requirements of workers during the pandemic were ensured and so safety was not an obstacle to include open spaces in the Accessibility Plan. During the hardest times of the pandemic outdoors had become important as spaces for recreation and a respite for many people.

The field work was divided into two large blocks. One was for collecting data and measurements in parks and children's play areas and the other for facilitating access to these areas for people with visual impairment. The collection of data and measurements, was carried out by a team of 44 people with disabilities (physical, learning, psychosocial and hearing impairment). The team visited 889 parks and children's play areas to gather information and identify points for future investment in achieving a "city where every child can play", in line with municipal policy⁴. Collecting data included features such as the width of entry points, paving type, play-feature usability and ease of moving around inside.

In the second block a team of five people, comprised of persons who were blind and partially sighted, were tasked with creating a model fact sheet for itineraries, parks and green spaces as points of urban interest. This project was based on the determination to strengthen the accessibility chain, in response to demands from people with visual impairment.

Communicative accessibility on itineraries: a model for an innovative descriptive fact sheet for people with visual impairments.

The project for compiling descriptive fact sheets for itineraries is aimed at offering clear and detailed information on the various sections of the routes people pass through from when they get off their nearest public transport to when they reach their desired destination (park, play area, green area, museum or beach). These fact sheets would be

³ <https://bcnroc.ajuntament.barcelona.cat/jspui/handle/11703/121623>

⁴ <https://bcnroc.ajuntament.barcelona.cat/jspui/handle/11703/116054>

targeted at people who are blind and partially sighted, who mostly get around by using a white cane or with a guide dog. As a result of the project, they will be able to get hold of valuable information, before leaving home, for planning and finding out about the routes they would follow.



Figure 11. Photos of the children's play area at the Jardins d'Elx, in the Sant Andreu district, with points marked where measurements were taken.

Up to then, accessibility had always been analysed separately from websites, transport, public thoroughfares, facilities and services. After listening to people with visual impairment, it was decided to go a step further than the mandatory regulations and respond to the needs for travel support, thereby taking into account all aspects of the accessibility chain. That way, besides equipping facilities and services with signs in Braille, tactile floor plans and 3D models, it would be possible to ensure people would know how to get to their desired destination and that full use would be made of resources that had already been installed.

So technical staff and people with visual impairment worked on identifying itineraries of interest, designing an information sheet and reaching consensus on what the best way

would be for standardising descriptions, which would eventually be used by people with visual impairments. Implementing the project enabled us to move on from the purely diagnostic phase of the Plan to the solution design and preparation stage for improving accessibility for a specific group.

First, a decision was taken to identify a significant number of parks in each of the city's 10 districts. Then it was decided that the description would be based on the nearest public transport point to each park entrance. After checking with the representative associations of blind and partially sighted people, it was agreed to prioritise the Metro as the setting-off point, before the other public transport options, given that the metro network is more stable over time (compared to the bus network, where stops can be more easily changed). Finally, once the itinerary setting-off points and destinations had been established, potential useful reference points were identified in the route descriptions.

The sheets were divided up into several sections to make them easier to read: one from metro platform to ticket-validation point; another from ticket-validation point to outside the Metro and another from the Metro exit to the park entrance. In addition, all the sheets included the return route as well.

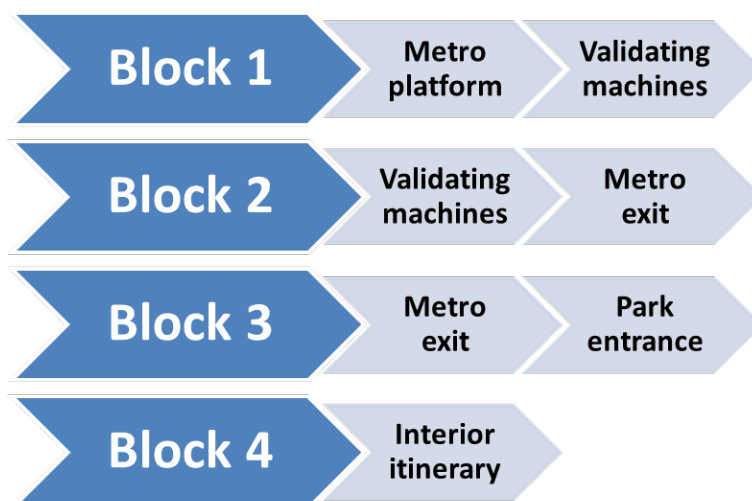


Figure 12. Diagram: blocks of the description in the itineraries to the parks (Diagnosis PAUB 2021, IMPD).

As regards the references and method of providing information in the sheets, standards were established for ensuring homogeneity, although some leeway was granted for workers to adapt descriptions to each type of itinerary according to their own criterion. The parameters common to all the sheets included the presence of tactile routing or paving inside metro stations or on the street; a person's position in relation to walls or façade lines; rotations in degrees or clockwise; the presence of dangers (such as car park exits or sharp changes in ground level); the traffic situation in relation to people; the presence of acoustic traffic lights on the itinerary and approximate distances in metres.

“We get off the metro train coach and walk ahead until we reach the tactile routing paving.

We turn 90 degrees to our left and walk ahead along the routing to the head of the train.

As soon as we detect a change of surface under our feet, we will know that the lift is on our right.

We continue moving along the routing, which we will note turns slightly to the left (approximately 10 o'clock clockwise) and we will reach the ascending stairs for leaving the platform.

We now face a staircase with 3 flights and 2 landings.

There are escalators on the right.

We go up the stairs and once we are at the top, we turn 90 degrees to the left, and just in front we will have the ticket validating machines FOR LEAVING.”

Figure 13. Example set of instructions from the metro exit to the park gate included in the accessible communication instructions (Diagnosis PAUB 2021, IMPD)

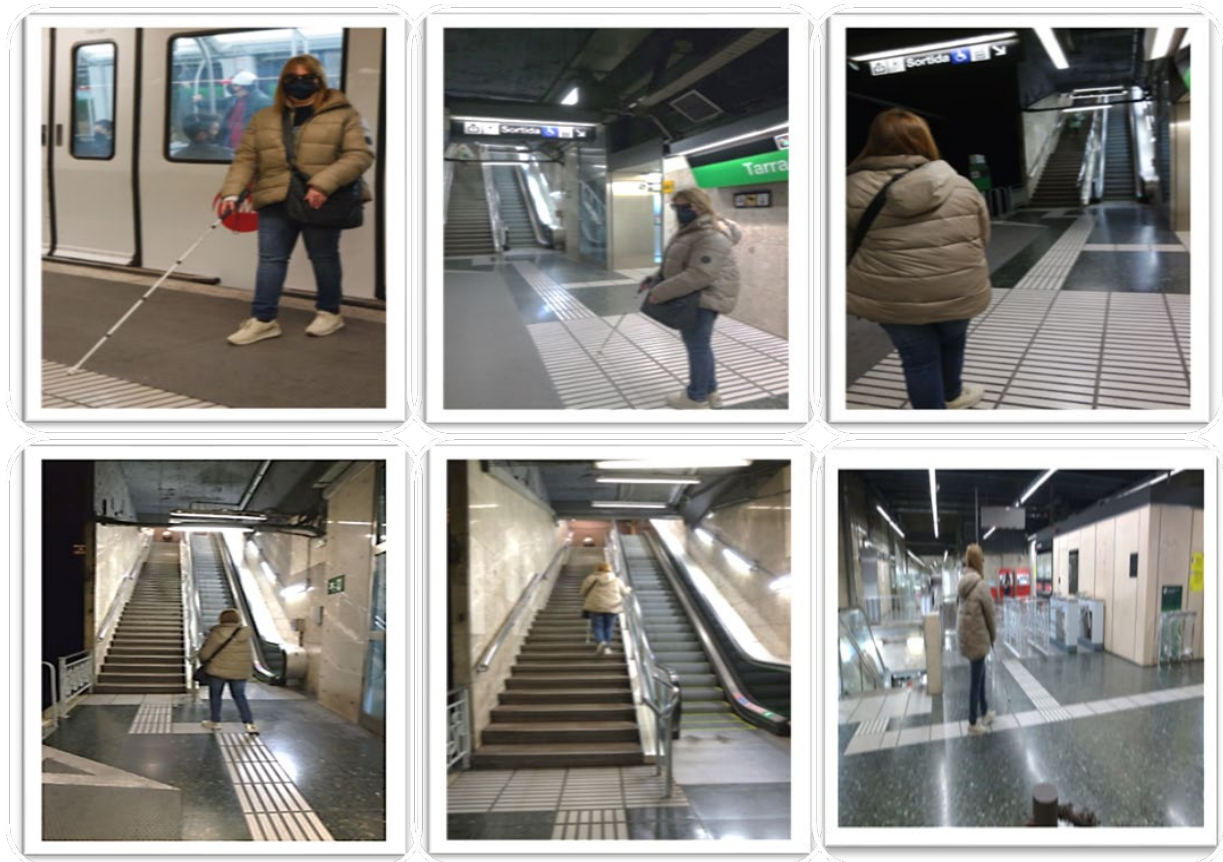


Figure 14. Set of six photos picturing a blind person who follows the example itinerary, from the Metro platform to the exit (Diagnosis PAUB 2021, IMPD).

For the purposes of ensuring optimum results, several roles were assigned to the five members of the working team: a coordinator organised the itineraries to be followed every week and revised the quality of the content of the sheets handed in; a specialist in document accessibility prepared accessible templates and verified the documents drawn up met digital accessibility requirements, and the other three individuals (two blind and one partially sighted person) went out to do the itineraries and fieldwork.

The work methodology ensured that the pair who did the itineraries always comprised a blind person and a partially sighted person. That ensured tactile and visual references were collected for as many people as possible. The organisation of the team consisted of daily outings, engaging the visually impaired person with the two blind people for the collection of data on alternate days: one day the pair explored the most accessible route with most references, recording every step orally; the other day, the blind person who did not join the pair along the itinerary worked on reviewing the itinerary itself and the related collected data and creating a sheet in digital format.

As a result, 38 itineraries from transport to park entrances were compiled. In view of the sheets' considerable usefulness, the areas of action were extended, and descriptions of itineraries were included for as many as 10 museums and 3 beaches with bathing-support services for people with disabilities. Finally, thanks to the motivation of the team and satisfaction with the results, the project ended up creating descriptive fact sheets for the interiors of 13 of Barcelona's iconic parks, located in its 10 districts. To that end, the teams were reorganised, this time coordinating people with visual impairments and people with non-visual disabilities. These teams examined the park interiors, working together to look at the structure and divisions of the park and make a proposal for the most accessible itinerary with comprehensive description. Thanks to this methodology descriptions were compiled for places of great historical and cultural interest in the city, such as Parc Güell, Parc de la Ciutadella and Parc de Cervantes, with the intention of publishing the various sheets on websites for public information and making them available to associations and to members of the population with visual impairments.

“At this point we are standing before Parc Güell's iconic staircase. It is divided into 3 flights of stairs and 2 landings. The staircase floor is white but its sides are covered with *trencadis* (broken ceramic-tile mosaics in several colours and shades). There are ornamental forms at the top of the first flight, the Catalan coat of arms on the second and, above that, the famous Dragon or Salamander figure covered in *trencadis*. We walk up the steps, noting the low walls on the right and the water flowing from the fountains on the left. Once we reach the top, we will have a low wall on the right and the Hypostyle Hall on the left. This hall is noted for having 86 columns supporting Nature Square above. To continue the route, we move on, following the wall on the right till it finishes. Here we turn 90 degrees to the right and continue for some three metres following the guide bump and shrubs on the right. We are now in front of the iron gate to the Austria Gardens.”

Figure 15. Description of Parc Güell interior (Diagnosis PAUB 2021, IMPD).

The aim behind including the descriptions of these must-visit, emblematic city sites is to take a step forward in making Barcelona's heritage more accessible and ensuring that persons who are blind and partially sighted have the right to enjoy these green public spaces. Examples of the data gathered in these sheets included information on the park's exterior (rectangular, oval, triangular), the areas it is divided into (such as a children's play area, a historical area, an area for dogs, a water area, lakes, fountains and so on), how to get from one area to another, the presence of guide bumps or other references, the form and colours of the architecture present and the plant species found there.

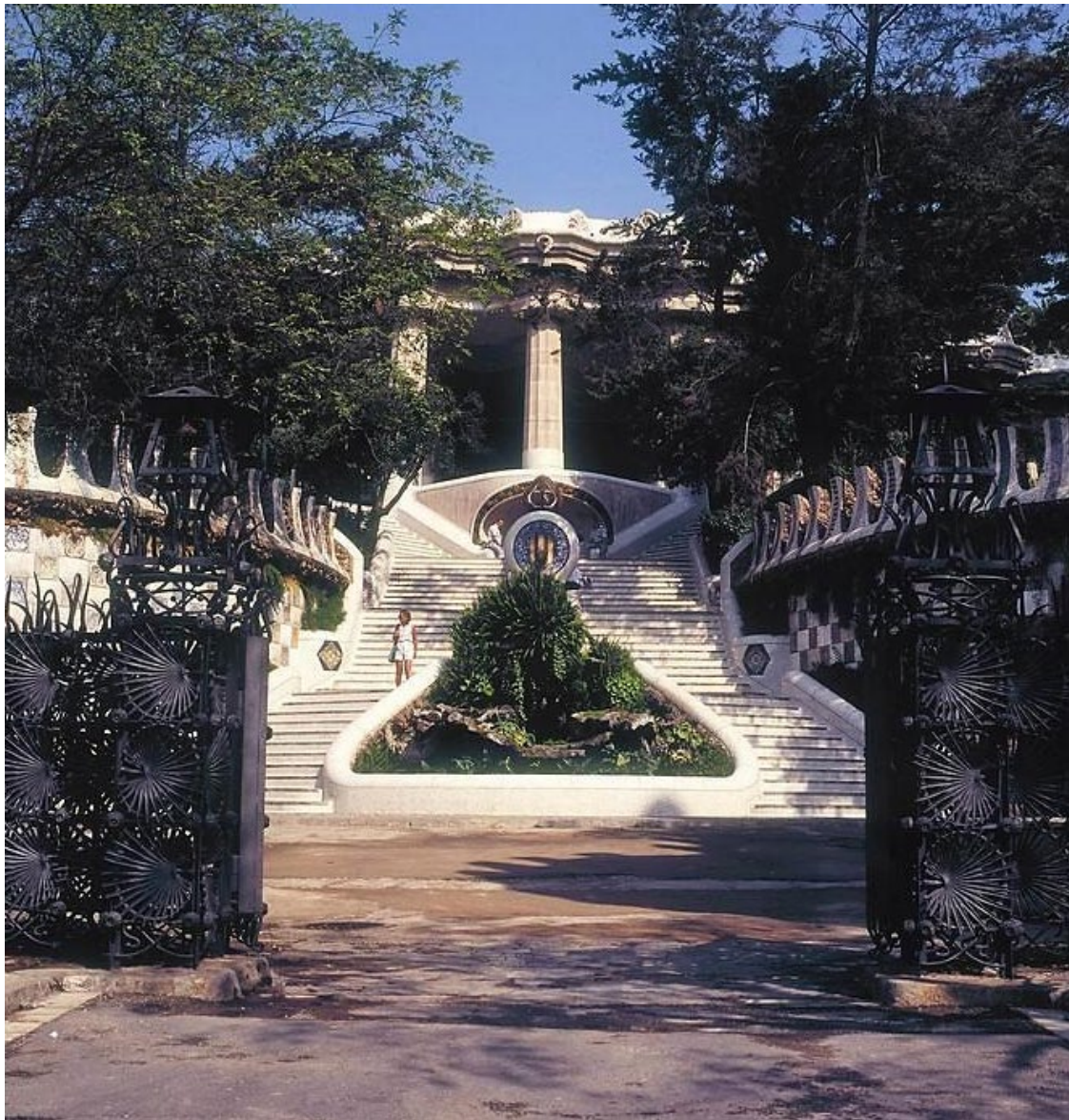


Figure 16. Entrance to Park Güell (Antonio Lajusticia, 2004, CC-BY 4.0, <http://hdl.handle.net/11703/75119>. Amendment: image cropped)



Figure 17. Images of the experimentation area. Jardins Joan Brossa (2022, IMPD).

“Once we reach the end of the path, there will be an experimentation area on the left. There is a wooden telephone with two boxes, some fifteen metres’ apart and connected by an underground metal tube. We move forward a few metres in a straight line, where we will find a play space on the right, with musical cushions. Note: there are 5 cushions, which are black and arranged in a circle. If you jump on them, several melodies are generated.”

Figure 18. Description of the route to the experimentation area. Jardins Joan Brossa (2022, IMPD).



Figure 19. Accessible play area at Parc de Joan Miró (image of the Diversem project, 2021, IMPD).

The project, developed by and for people who are blind and partially sighted addresses their accessibility needs and preferences when getting around the city on their own and which have been further highlighted by the pandemic. At the same time, thanks to the experience, good practices have been identified as well as new challenges and aspects that could be improved in areas such as tactile and acoustic signage in open environments that include parks and points of interest such as entrances to public facilities.

Likewise, and thanks to the 13 sheets for the interiors of the city's most significant parks, persons who are blind have been offered valuable information hitherto unavailable to them. So, for example, blind parents who wish to travel with their child to the park can find out, before they leave the house, the games they will find at the park and whether there will be nature spaces available with animals such as ducks and frogs. Processes that are simple for sighted people, such as taking a quick look at images on the internet to decide on whether to visit one place or another, can be very complicated for someone who is blind. Blind tourists will also benefit from the information on the sheets, as it will enable them to discover each space's architectural heritage, find out whether the parks have sculptures or other attractive tactile features, discover sites for listening to the sounds of native fauna or spaces with trees or aromatic plants that stimulate the olfactory senses. That way visits to and stays in the city will become much more attractive experiences, adapted to each person's senses.

Conclusions and future challenges

This innovative project in the framework of Barcelona's Universal Accessibility Plan has increased the accessibility resources available for Barcelona residents and visitors with disabilities, offering employment to a group of people with disabilities, whose personal expertise is contributing to a better investment in public policies. The descriptions for facilitating itineraries ensure the accessibility chain is maintained to the full, as stated in Article 9 of the Convention on the Rights for People with Disabilities (CRPD): from when the person decides where they wish to go to when they receive the itinerary information, they go there, reach the service point and can enjoy it all as an equal. In addition, thanks to exploring various environments, city needs have been detected and some of the political priorities on accessible communication have been set for the coming years, which depend on drafting a Tactile Paving and Flooring Installation Plan, an Acoustic Traffic Lights Plan (to go from the current figure of 81% to 100%), the integration of accessibility information into accessible multi-channel platforms and an Acoustic Devices Implementation Plan that enables blind people to locate the entrances to public facilities or points of interest in the city.

People with disabilities have taken part in the diagnosis of the Barcelona Universal Accessibility Plan⁵, whether working for the City Council or through participatory mechanisms run by the Municipal Institute for People with Disabilities. The procedure for improving universal accessibility was to carry out an operational audit of the services offered by the city and of the suitability of its streets and facilities. This audit has enabled a layer of accessibility data to be built that needs to be extended and kept up to date for the purposes of taking informed political decisions. In the short term, measuring the

⁵ The Barcelona Universal Accessibility Plan is promoted by the Municipal Institute of People with Disabilities (IMPD) and coordinated by the Department for Planning and Evaluation.

degree of accessibility of everyday environments has enabled several city locations and services to be compared, accessibility solutions to start being noted and innovative projects implemented. In the first case, low-cost initiatives relating to facility and public highway maintenance can be highlighted. In the second, projects such as the descriptive fact sheets for improving communicative accessibility to itineraries enable the addition of accessibility content to municipal communication platforms.

To sum up, working together with people with disabilities is essential to cities in their action to maintain accessibility standards. What is more, it is decisive specially for those cities willing to champion universal accessibility and build, through continuous innovation, a more inclusive, egalitarian and barrier-free environment, where facilities, services and public space welcome everyone.