

Universal Accessibility in regular bus lines in Spain

Cristina Dueñas Díaz-Tendero

University of Jaén, Spain, [ORCID 0000-0002-3793-0514](https://orcid.org/0000-0002-3793-0514), cristina.duenasdiastendero@gmail.com

Ángeles Verdejo Espinosa

University of Jaén, Spain, [ORCID 0000-0002-7998-553X](https://orcid.org/0000-0002-7998-553X), mverdejo@ujaen.es

Yolanda María de la Fuente Robles

University of Jaén, Spain, [ORCID 0000-0002-2643-0100](https://orcid.org/0000-0002-2643-0100), ymfuente@ujaen.es

Received: 2021-12-08 | Accepted: 2024-02-19 | Published: 2024-05-11

Abstract: Transport infrastructures are fundamental elements to achieving social cohesion, territorial development and the productive growth of society, but they must be accessible, sustainable, resilient and of high quality. There are several plans at the local and European levels that address strategies and directives to achieve inclusive public transport that adheres to the parameters of sustainability and accessibility. Therefore, in this work we have conducted a study and analysis of the situation of intercity regular bus public transport in Spain. In addition to carrying out an exhaustive bibliographic review on the importance and interest of public transport and accessibility, we also reviewed companies in the sector in order to reinforce our research. A survey of different groups of people, with and without disabilities, was performed to provide a broad and diverse view of the problems and advantages of public bus transport. The advances and challenges of using this means of transport for the mobility of people and its importance to improving society have been analysed. This research seeks to extract an in-depth analysis - through a review of the literature and surveys of 82 people - of the accessibility chain in regular bus lines in Spain, and to offer proposals and recommendations that can help the main stakeholders in the sector to offer accessible, inclusive and quality transport.

Keywords: Universal Accessibility; Intercity buses; Regulatory; Accessibility Chain; Challenges.

1. Introduction

According to INE data recently published in a report on passenger transport (Passenger Transport Statistics. Provisional data (INE, 2022), more than 399.4 million passengers used public transport in Spain in May, 37.7% more than in the same month of 2021. When we focus on interurban transport, the figures reveal that 111.5 million travellers used this option in May this year, an increase of 43.6% compared to the same month in 2021.

Table 1 shows the data for the different modes of interurban transport and the number of passengers in each mode. As we can see, the intercity bus is the mode of collective transport most used by passengers, surpassing rail, air and sea transport.

In addition, it is important to note that the interurban bus is the means of transport that is most present in all municipalities; in fact, in many small rural towns, this is the only public transport option available to residents. It is also a very economical means of transport.

Table 1. Intercity transport. INE (May, 2022)

| Intercity Transport | Number of Passengers transported (thousands) | Rate (%) Annual | Rate (%) of the year-to-date average |
|-----------------------------------|--|-----------------|--------------------------------------|
| Suburban bus | 42425 | 39.5 | 41.2 |
| Medium-distance bus | 15407 | 51.9 | 53.2 |
| Long-distance bus | 933 | 100.9 | 144.5 |
| Total bus | 58765 | 43.3 | 45.1 |
| Suburban railroad | 43034 | 35.6 | 38.7 |
| Medium-distance rail | 2644 | 71.2 | 82.8 |
| Long-distance rail | 2728 | 108.6 | 155.0 |
| AVE Railway | 1902 | 124.6 | 173.6 |
| Rest of the long-distance railway | 826 | 79.3 | 121.7 |
| Total railway | 48406 | 40.0 | 43.9 |
| Peninsular air | 1332 | 160.0 | 218.2 |
| Peninsular air-rest of territory | 1769 | 134.7 | 212.5 |
| Inter-island air | 465 | 35.4 | 65.7 |
| Air (inland) total | 3566 | 121.6 | 180.0 |
| Maritime (coastal) | 809 | 66.5 | 99.9 |
| TOTAL | 111547 | 43.6 | 46.9 |

* Suburban includes all rail operators, and only RENFE for medium distance and long distance.

The Observatory of Universal Accessibility of Interurban Transport 2012 captured this idea perfectly: "This means of transport is the lowest common denominator of mobility in Spain" (ONCE, 2013).

Having described the current situation of this means of transport, let us now consider the following question: if the intercity bus is so common in our municipalities, and is in many of them the only means of connection with other towns, can it be used by everyone? That is to say, can all citizens benefit from this means of transport?

To answer in the affirmative, Universal Accessibility and the Principles of Universal Design or Design for All must be present. According to LIONDAU (LIONDAU, 2003), Universal Accessibility is "the condition that environments, products and services must meet in order to be understandable, usable and practicable for all people". (Head of State, 2003).

Universal Design, or Design for All, aims to design products or services that can be used by the greatest number of people. The principles that govern this methodology are:

- Equivalent use.
- Flexible use.
- Simple and intuitive to use.
- Perceptible information.
- Tolerant of error.
- Low physical effort.
- Size and space for access and use.

At this point, it should be noted that Accessibility is a right that is included in Art. 9, Accessibility, of the International Convention on the Rights of Persons with Disabilities:

“To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to, inter alia:

- a) Buildings, roads, transportation and other indoor and outdoor facilities, including schools, housing, medical facilities and workplaces;*
- b) Information, communications and other services, including electronic and emergency services. (UN, 2006)”*

The European Union's Strategy for the Rights of Persons with Disabilities 2021-2030 (Union of Equality: Strategy for the Rights of Persons with Disabilities 2021-2030) reflects upon the importance of accessibility when accessing services and products on equal terms:

*“Accessibility to the built and virtual environments, to information and communication technologies (ICT), goods and services, including transport and infrastructure, is an enabler of rights and a prerequisite for the full participation of persons with disabilities on an equal basis with others.
(European Commission, 2021, p. 6)”*

Transport is also mentioned: “Passenger rights guarantee the right to non-discrimination in access to transport and to receive assistance free of charge for passengers with disabilities and reduced mobility travelling by air, rail, maritime means of transport, or bus and coach.” (European Commission, 2021) Specifically, the goal is to guarantee non-discrimination in access to transportation and free travel assistance for people with disabilities and reduced mobility.

At this point, linking the ideas of Universal Accessibility and transport, we can define accessible transport as that which enables the right to mobility for all people, i.e., the ease of movement from one place to another, in an autonomous, safe and dignified manner, both in urban and interurban travel, in the different modes of transport.

If we focus on regular intercity buses, can we say that Universal Accessibility exists? Unfortunately, we can affirm that very little progress has been made in this field, but we will

discuss it in greater depth over the course of this document. This is largely the result of the low level of adaptation due to the existence of an atomized market, i.e., small companies. Moreover, the current regulations do not contribute much to achieving this, as we will see in the following section.

In order to achieve Universal Accessibility in interurban public bus transport, there must first be a commitment on the part of government agencies and private intercity bus companies to provide this service in a meaningful way that goes beyond just nice-sounding words on a page. Also necessary is the idea that accessibility benefits us all and therefore, when it does not exist, it leads to discrimination and the exclusion of groups.

1.1. State of art

We can compare this project to those previously carried out on the same topic, such as:

- Comprehensive Study on Accessibility to Public Transport in Spain conducted in 2018.
- Accessibility, Safety and Design for All in Transportation published in 2016.
- Observatory of Universal Accessibility in Interurban Transport in Spain 2012
- Universal Accessibility of Modes of Transport in Spain: Current Problems, Main Advances and Future Challenges, which was published in 2012.
- The Accessibility of Bus Transportation: Diagnosis and Solutions. Study conducted in 2006.

The first, the degree of accessibility of the different means of public transport in Spain is analysed, with the aim of obtaining a diagnosis that can be used in public policies in this area and in a National Accessibility Plan. The section on interurban buses deals with the technical specifications for the concession of long-distance interurban routes for the regular transport of passengers for general use and other obligations required of the contractor, from which information is obtained on the fleet of accessible interurban buses in Spain and a brief summary of the companies that manage them and their actions on accessibility and for people with disabilities (Díaz Velázquez, 2018). *“Specifically, of the 1148 vehicles, 46.25% had measures in place to facilitate access to transport for the people with disabilities or reduced mobility (Díaz Velázquez, E., García, C., 2018, p. 204-205)”*.

In the second, the information collected focuses on accessibility, safety in road vehicles for people with reduced mobility especially at the level of road transport regulations and legislation. Specifically on intercity buses only what they are is explained (Dols Ruiz, 2018).

The third shows how, especially in rural areas, interurban transport is essential for the mobility of many people and accessibility is fundamental to achieve quality mobility for all. However, intercity buses do not have many accessibility measures in place. Furthermore, the Observatory specifies what an intercity bus journey is like, i.e. the accessibility chain. Finally a series of recommendations are given based on design for all, regulations, good practices, training, research and innovation. In this Observatory, research work is carried out to diagnose the state of accessibility in interurban transport in 11 towns and cities and the link between them (ONCE, 2013).

The fourth section reviews the current situation and main initiatives for universal accessibility in all passenger transport in Spain, as well as the current regulations and the challenges for the future. As far as intercity buses are concerned, it is shown that this is the means of transport that

has evolved the least in terms of universal accessibility and some noteworthy initiatives in regions of Spain are presented (Juncá Ubierna, 2012).

The fifth document is the only one that focuses exclusively on bus transport (interurban and urban) and is closer to the present project. At the beginning of the document, the legal framework is presented, then the business context of this sector, followed by the needs and problems linked to the lack of accessibility and its relation with people with disabilities, and finally the objective and proposals. The general objective is that everyone can make use of these means of transport as long as universal accessibility requirements are taken into account. And among the proposals, greater involvement of the Administrations, how the business sphere intervenes and the participation of associations of people with disabilities, as well as training, compliance with legislation, commitment to innovation, comprehensive accessibility programmes in bus companies and improving attitudes and behaviour in favour of accessibility (Vega Pindado, 2006).

Regarding the similarities and differences between the five previous document and this project, none of them focuses exclusively on intercity buses, the only one is the last one where this subject plays a very important role. In the Observatory, research is carried out as in this study, but the difference lies in the fact that the data collection is different, as we carried out a survey and a review of the companies in the sector. And in the fifth, there is a difference, which is the survey.

We would like to thank you for publishing these studies, documents and research, which helped us in the preparation of this research work.

1.2. Structure

In the first part of the article, an introduction to interurban transport in Spain is given, statistical data is collected and the main indicators for the study are obtained. It is found that the bus is one of the main means of interurban transport. A first analysis is made of the accessibility situation in this type of transport, taking into account the parameters of accessible design for all persons, regulations and current legislation (the part of regulations and legislation is shown in the project in its extended version). The second part of the manuscript investigates the accessibility chain and DALCO¹ criteria. The survey was conducted among 82 people residing in Spain. Finally, a survey of people with and without disabilities is carried out to obtain results on important issues in the field of accessibility in interurban transport. Finally, the conclusions of the research and bibliographical references are presented.

2. Methodology

Several methodologies were combined during the preparation of this work. On the one hand, we conducted a bibliographic review of regulations, manuals, books, research papers and web pages relevant to the subject at hand. We also contacted companies in the sector and the General Directorate of Land Transport's Sub-Directorate General of Management, Analysis and Innovation in Land Transport to ascertain the current situation in the sector (this part is shown in the project in its extended version).

Moreover, in order to enhance the document, be as realistic as possible and capture the everyday situations of many people when travelling by this means of transport, we administered a survey

¹ DALCO Criteria: They are a series of requirements related to the actions of 4 wide groups (AENOR, 2007): Ambulation, Apprehension, Location and Communication. These actions must be satisfied in order to guarantee the global accessibility to environments, products, and services

to gather the impressions, experiences and opinions of 82 people living in Spain, 48 of them with disabilities and 34 without.

2.1. Accessible mobility

Today, private vehicle transportation leads any ranking of transportation use. This trend should change towards a greater use of collective public transport, due to, among other reasons, sustainability and the fight against climate change. It has been proven that public transport is more efficient and less polluting than private transport.

Mobility is a right we all have, as stated in Art. 13 of the Universal Declaration of Human Rights: "1. Everyone has the right to freedom of movement and residence within the territory of a State." (UNITED NATIONS, 1948).

Mobility is an essential element to enable social and economic growth, so it makes sense that everyone be able to partake in this action. Interurban mobility plays a major role here, since every day millions of people travel from their homes to other municipalities or regions to engage in their private, professional and social lives.

Let us take a closer look at the term that appears in the title of this section: accessible mobility. According to the definition given in the book *Universal Accessibility and Design for All. Architecture and Urbanism*:

"It consists of the systematic application of the principles of Universal Accessibility to all those areas of the external environment that allow for the development, use and enjoyment of the same in conditions of safety, comfort, efficiency, personal autonomy, sustainability and ease of use. In this context, transportation is a key element, as it provides the backbone of the mosaic of accessible mobility. (Fundación ONCE, 2011)"

Given this definition, we want to reinforce the idea that accessibility and mobility must go hand in hand, that there can be no mobility only for the majority that results in isolation and discrimination of a minority, such as people with disabilities and the elderly. This is why transport is so important, especially public transport, which must exhibit all the accessibility requirements in the five fundamental parts of mobility expressed in the book *Universal Accessibility and Design for All. Architecture and Urban Planning*: "Fixed infrastructures or installations. Rolling stock or vehicles. Frontier or links between both. Information, communication, guidance systems. Management and provision of services." (Fundación ONCE, 2011) . However, this is not always the case, as we will see below.

Accessible public transport promotes mobility, but also parts of the lives of citizens, such as the option to work, leisure, travel due to health issues, tourism, personal relationships, and it greatly helps groups such as people with disabilities and the elderly. CERMI already reflected this idea in its 2002 study, in which it conducted a survey of associations.

"The ability to use the means of transportation available to the public is particularly important for a normal life and full participation in society. Some 35.6 percent of the people referred to in the questionnaires have experienced discrimination in accessing public transportation, and not only as a result of physical barriers (inadequate infrastructure and fleets), but also due to attitudinal problems and communication barriers. People with physical and

*sensory disabilities are the most affected by this type of discrimination
(García, 2003)”*

Collective accessible mobility can be one of the tools to eliminate exclusion. In the article on GIS Approach Applied to Tourist Bus Route Design on Lanzarote Island highlights how the accessibility of public buses can improve leisure and tourism opportunities for people who live in rural areas:

“The new tourist bus lines proposed here have several advantages for rural populations. They would improve accessibility to leisure facilities for residents in terms of decreased travel time. Those populations would also have two options to travel: at peak time or off-peak time. Most tourism workers would save a lot of travel time in accessing their place of work at one of the tourist centers on the Island. This suggests that time-based exclusion would be improved because this new services provides an incentive to mobility for rural residents (Rendeiro Martín-Cejas, 2021)”.

2.2. Accessibility chain and DALCO criteria

We can define the accessibility chain as "the set of elements that, as part of the user's process of interacting with the environment, allows the realization of the activities anticipated in it". (AENOR, 2007).

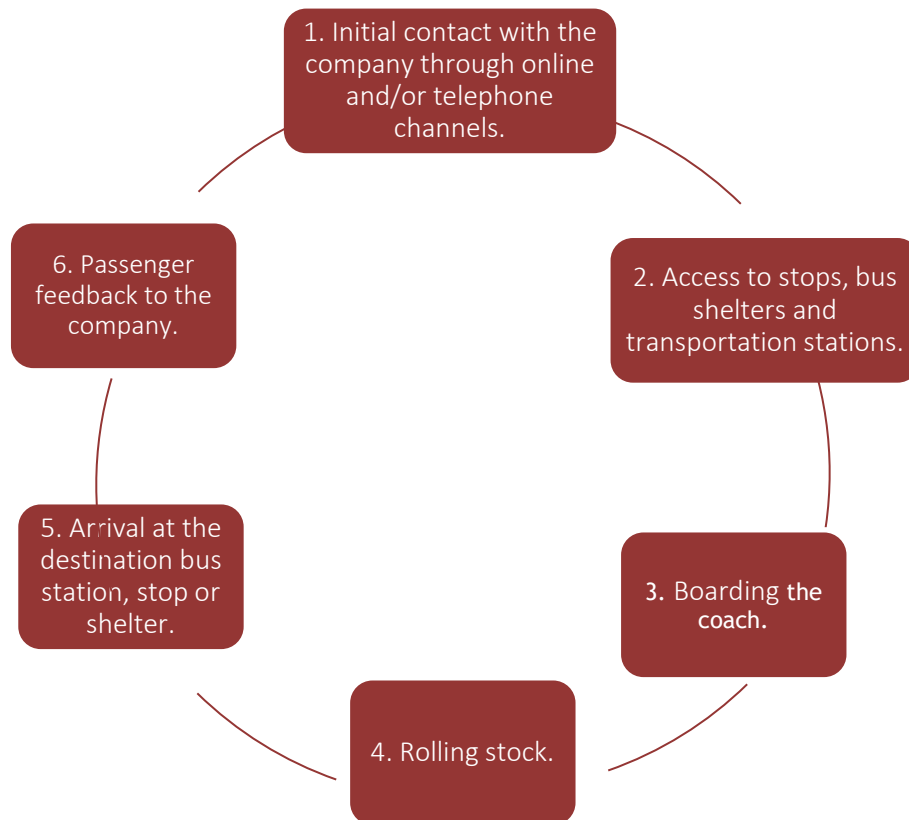
If we extrapolate this to intercity bus transportation, we can say that the accessibility chain must not be broken at any step from the time a user takes the initiative to travel until they reach their destination. It is of no use if the origin and destination are accessible but the journey is not because there are barriers that prevent users from doing so. When we talk about a trip, we refer to the service that allows us to go from one municipality to another.

Before delving into the accessibility chain, it is necessary to explain what the four DALCO criteria are and why they are so important. They are explained in detail in the standard UNE 170001-1:2007. Universal Accessibility. Part 1: DALCO criteria to facilitate accessibility to the environment.

- The first of these is Ambulation (“deambulaci3n” in Spanish), meaning the action of moving from one place to another. Mobility can be both horizontal and vertical and rely on the individual's own means, technical aids or the use of means of transportation.
- The second is Apprehension, the action of taking or grasping something. It refers to the ability to manipulate, grasp, twist, press, reach and grasp. It must also consider manual, auditory and visual scopes.
- The third criterion is Localization, the action of locating. In other words, it refers to the ease with which the precise place where something or someone is located can be determined
- The last one is Communication, the exchange of information necessary to carry out an activity. This criterion takes into account interactive communication (visual, tactile or acoustic), panels, graphic and written signs, luminous, acoustic and tactile signs. (AENOR, 2007, p.6-14).

We will next study the Accessibility Chain bearing in mind the four criteria explained above in order to provide a quality service for everyone. Schematically, the links are those shown in Graph 1.

Graph 1. Accessibility chain. Compiled by authors



.An example of where the transport accessibility chain can be implemented is in the tourism accessibility chain, as transport is an essential element in the sector. Bus stops are part of a link in the tourism accessibility chain. If the chains are broken, it is definitely not possible to complete journeys, to go to destinations...in short, to enjoy tourism on equal terms.

In the research carried out in the tourist areas of Maspalomas Gran Canaria on the accessibility conditions for people with physical disabilities, it was revealed that there was a deficient walkability, causing the accessibility chain to be broken. Furthermore, it was concluded that it is necessary to undertake accessibility actions in order to reinforce the competitiveness of tourism products (Santana Santana, 2020).

However, although this research focused on people with physical disabilities, it is important to emphasise the goal of achieving universal accessibility for all people.

2.2.1. Initial contact with the Company through online and/or telephone channels

Nowadays, many people decide to purchase tickets in advance of the trip. To do so, they access websites or phone the company providing the service. In addition, information about lines and schedules and other relevant company information can be found using these methods.

Websites must be accessible so that everyone can access them to find answers to their questions and make purchases. To do so, they must be compatible with the assistive products used by many people with disabilities.

Websites must offer personalized solutions that address the needs of customers and that promote interaction with them. For example, a hearing-impaired person has the right to be able to communicate, and the company has to offer a service with a live sign language interpreter on

the website. The information published on the website should seek to be understood by customers. Pictograms provide one solution, and videos must be subtitled and interpreted in sign language.

Another way to contact companies is through official telephone numbers, which, as mentioned above, must also take into account accessibility. This option is not chosen by the hearing impaired, so tele-interpretation would be more appropriate and should be offered by companies.

Regardless of the medium chosen, customer service personnel should provide a quality interaction during this initial contact, a quality that should be present throughout the rest of the accessibility chain. Companies must train their personnel in accessibility and disability issues.

Normally, PRMs (People with reduced mobility) must give 48 hours' notice to the company providing the service that they wish to travel with them, so that the company can make the necessary adaptations to the vehicle. From our point of view, this should change, since people with reduced mobility should not be required to inform travel providers of their desire to travel in buses, which should offer accessibility conditions from the very beginning, ideally on every route. We realize the complications this entails for the transportation sector due to space and investment concerns, but it is the only solution that guarantees equal access to everyone.

2.2.2. Access to bus stops, bus shelters and transport stations

In these facilities, accessibility must be taken into account as a multi-dimensional facet that involves all the services provided there. In addition, the four DALCO criteria must be taken into account. Accessible PRM parking spaces should be located as close as feasible to these places in order to allow this group to access these locations as autonomously as possible, and thus begin or end their bus journey. Bus stops and shelters are the only waiting areas in many towns in Spain. They are also common in the neighbourhoods of large cities. Due to adverse weather conditions, there must be a roof to provide protection in these situations.

Moving on to accessibility, the points to consider include the following:

- There should be no barriers to access these spaces.
- Pavement properly maintained, with non-slip surface and no uneven tiles or holes, tactile paving with a different texture and colour.
- Accessible standing seats with armrests and backrests. In addition, they must have sufficient space for wheelchair users.
- Information panels in easy-to-read and Braille format. One resource currently used is QR codes, which are quite accessible but require users to have access to a cell phone and an internet connection.

Bus stations must also facilitate both horizontal and vertical circulation, which can be achieved by implementing these measures:

- Horizontal movement.
 - Accessible access.
 - Accessible signage.
 - The main door must be accessible, and if it is not, an alternative accessible route must be provided that is properly signposted and does not require a great effort from the person

who needs it. They must also provide access to the same services that are available to those entering via the front door.

- Bridging the difference in level between the sidewalk and the access to the building in a way that is accessible and promotes autonomy without undue effort.
 - Passageways must be wide enough for a wheelchair user to manoeuvre (diameter of 1.50 m) without obstacles.
 - In addition, it must be possible to operate doors without problems. Automatic doors can be a good resource, but they must be properly marked.
 - Inside the station, there should be no obstacles that make movement impossible. Signage can help people determine their current location. Proper lighting and contrast will be necessary for people with low vision, and paving that guides users to the different areas is recommended. In addition, the pavement should be slip resistant.
 - Normally in these buildings, the arrival or departure of buses, timetables, etc., are announced by public address system, so it is necessary to install hearing loops for people who use hearing aids. The information that is conveyed orally should also be displayed in writing, which is why the size, colour and text on the screens must be taken into account.
- Vertical movement.
 - The best option is an elevator for comfort and safety.

Three key areas of high passenger flow within stations are bathrooms, waiting areas and customer service, which should all have the necessary accessibility features.

2.3. Boarding the coach

Users should be able to board buses as autonomously as possible. Due to their height, PRMs generally have considerable difficulty climbing stairs, so coaches should be equipped with a safe platform lift to enable boarding.

If, however, passengers can use the stairs, they should not be overly steep, and the size of the treads and risers should be such that they can be climbed comfortably, and feature non-slip flooring. We recommend the use of a bar or a support to assist with this climb.

Figure 1. Lifting platform. Mobility Car Solutions. (Mobility Car Solutions, 2023)



2.4. Rolling stock

We use the term rolling stock to refer to the vehicle, i.e. the coach. This means of transport has a great disadvantage in that there is little space available in its interior, which makes adaptations complicated, but not impossible.

The inside of the vehicle should provide the greatest possible freedom of movement without the need for assistance. To this end:

- There should be no steps, with the entire interior at the same level.
- There should be areas for anchoring wheelchairs with adequate and safe restraint systems.
- Free space is needed for wheelchair users.
- Some seats must allow transfer from the wheelchair to the seat by folding down the armrests.
- The space between rows of seats should be wide enough for passengers to sit without any problem.
- There should always be at least one seat reserved for PRM near the driver and the front, or accessible, door. This seat should be wider than the rest, with a support point and properly marked with the ISA.
- Colour contrast can be used to mark the seats and distinguish them from the others on the coach.
- Seats numbers should be in high relief or Braille format.

Information and documents provided to travellers, such as complaint forms, should be available in formats accessible to everyone. Drivers should engage with people with disabilities, the elderly, pregnant women, and children in a manner that is as respectful as with other travellers but takes into account the needs of each group.

As Pilar Vega comments in the book “The Accessibility of Bus Transport. Diagnosis and Solutions” (Vega Pindado, 2006), companies should realize that in order to offer a quality service, accessibility must be present and the staff should be trained in this area and in disability as well:

Another problem we encounter is that many times drivers do not wait for passengers to settle in before resuming the trip, which can cause riders to lose their balance and fall. Coaches should be equipped with an area in the trunk in which to stow the support products needed by people with disabilities who wish to travel in this means of transport with the necessary safety measures. And they should not be charged for this service.

“Public transport managers understand the importance of service quality to improve passenger appeal, and thus business profits. However, accessibility is not always viewed as a fundamental element in improving quality. Most companies understand this concept, but only partially. They strive to renew their fleets and make them accessible, but they do not understand that the rolling stock must be renewed alongside renewed guidelines and behaviour towards the user, and especially towards the target of these technical improvements: people with disabilities. (Vega Pindado, The accessibility of bus transport: Diagnosis and solutions., 2006)”

Figure 2. 100% inclusive bus. Autocares Víctor Bayo. (Bayo, 2023)



Finally, we should like to focus on guide dogs, which have to be with their owners at all times, meaning they should be allowed to board the bus and have a place next to their owners.

In Spain, one example of a 100% inclusive bus is provided by the company Autocares Bayo for tourist trips and excursions. Although it lies outside the field of concern of this paper, as it is not a regular bus line, we would like to provide this example of how a company has achieved a milestone that could point the way for companies operating regular lines.

2.5. Arrival at the destination station, bus stop or bus shelter

As was the case at the departure bus station, shelter or stop, these same elements should satisfy the same accessibility criteria upon arrival.

2.6. Passenger feedback to the company

Trips do not always end the way we would like them to, which is why we must have the option to file claims in cases of lost objects, delays, improper service, and so on; or, on the contrary, to thank the company the service received. In any case, accessibility must be a feature of every document (complaint/gratitude forms) or channel used for these purposes (online and/or telephone); for example, by providing forms in Braille and easy-to-read text in a suitable font size and colour, with sign language interpretation as needed, and digital accessibility.

We have reached the end of the accessibility chain. We have taken the same journey through its various links that many people make throughout their lives, but that many others cannot due to a lack of accessibility. At this point, we would like to reflect on the reflections of Pilar Vega Pindado in her book *La accesibilidad del transporte en autobús. Diagnóstico y soluciones*:

“However, sometimes the systems do not work, or the transport chain cannot be completed due to circumstances such as deficiencies in public address systems or ticket vending machines, flooded or unsanitary restrooms, defective ramps or broken elevators in the terminal. Therefore, once the link in the transportation chain where a problem exists has been identified, it is necessary to solve it in order to make the service universally accessible. (Vega Pindado, 2006)”

In other words, maintenance should always be considered to ensure that every mechanism and space is in perfect condition, and if they break down or malfunction, repairs should be carried out in the shortest possible time, since many people depend on them to make the trip.

Before concluding this section, we would like to highlight the figure of the "travel assistant", which is very common in air and rail transport, but less so in intercity scheduled bus transport. We believe that it is a key element in the service provided to groups such as people with disabilities, the elderly, pregnant women and children, which we already discussed earlier. The presence of such a figure would greatly help to improve the quality of the service.

3. Results

The survey was conducted through <http://www.google.es/intl/es/forms/about/> and titled "Universal Accessibility in Regular Intercity Bus Lines".

When the survey was administered, the first step was to send it to associations and groups of people with disabilities, whom we believed might be interested in the subject given the lack of accessibility in their everyday routine, but we also wanted to learn the perspectives and opinions of people without disabilities, since accessibility benefits us all.

It is true that we are often unaware of the lack of accessibility, or, on the contrary, of its presence because we do not need it at that moment, but that situation can change at any time, which is why transportation, like all other services, should be accessible from the start.

The survey was based on the following questions, and in some cases the respondents were allowed to choose more than one answer.

The answers to the sixth question indicate that this survey was mainly administered to individuals with physical and visual disabilities, as shown in Graph 1.

The ninth question reveals that the option selected the most by people with and without disabilities is the private vehicle.

Table 2. Survey. Compiled by authors (June, 2021)

| Question number | Question | Answers |
|-----------------|---|---|
| 1 | Name (you can write "anonymous" if you prefer not to give your name). | Name |
| 2 | Gender | <ul style="list-style-type: none">• Female.• Male.• Non-binary. |
| 3 | Age | |
| 4 | Place of residence: country and location. | Place |
| 5 | Do you have a disability? | <ul style="list-style-type: none">• Yes• No |

| Question number | Question | Answers |
|-----------------|---|---|
| 6 | Type of disability. (You can choose several answers) | <ul style="list-style-type: none"> • Physical. Hearing. • Visual. • Intellectual. • Mental. • Acquired brain damage. • Autism or Asperger's. • I do not have a disability. • Other. |
| 7 | Do you belong to any association or group of people with disabilities? | <ul style="list-style-type: none"> • Yes. • No. |
| 8 | If you answered yes, can you tell us which one? | Response |
| 9 | What means of transport do you use on a regular | Response |
| 10 | Have you encountered barriers when riding or attempting to ride a bus? If so, can you tell us what they were? | Response |
| 11 | From your point of view, are intercity buses accessible? | <ul style="list-style-type: none"> • Yes. • No. • I don't know. |
| 12 | If you answered no to the previous question, what changes would you include to make them accessible? | Response |
| 13 | From your point of view, are the bus shelters, bus stops and bus stations in your area accessible? | <ul style="list-style-type: none"> • Yes. • No. • I don't know. |
| 14 | If not, what changes would you include to make them accessible? | Response |
| 15 | If you needed to go to the bathroom while at a bus station, was it adapted for people with disabilities? | <ul style="list-style-type: none"> • Yes. • No. • I have never used the bathroom in a bus station. |
| 16 | If not, what changes would you include to make it usable for everyone? | Response |

| Question number | Question | Answers |
|-----------------|--|--|
| 17 | What type of accessibility is most present on intercity buses? (Multiple answers are possible). | <ul style="list-style-type: none"> • Physical accessibility. • Sensory accessibility. • Cognitive accessibility. <ul style="list-style-type: none"> • All of them. • None of them. |
| 18 | Tell us an example | Response |
| 19 | Do you think that the staff of intercity buses (drivers, customer service) are trained in accessibility and disability issues? | <ul style="list-style-type: none"> • Yes. • No. • I don't know. |
| 20 | Do you think that providing assistance to disabled passengers, elderly people, children and pregnant women is essential? | <ul style="list-style-type: none"> • Yes. • No. • I don't know. |
| 21 | If your local bus was accessible, would it lead to a better quality of life? (You can choose several answers). | <ul style="list-style-type: none"> • Yes, I would be more independent. • Yes, I could get a job outside my town or city. • Yes, I could go to theatres, cinemas, sporting events, leisure activities. • No. |
| 22 | Do you have any comments? | Response |
| 23 | Provide your email if you would like to receive the results of this survey. | Response |

From the tenth question, we note the following reflections from people with disabilities:

- To a great extent, they comment on design aspects, such as defective ramps or elevators, high steps, seat belts that do not work, seats, wheelchair restraints.
- Unpleasant attitude from drivers, who do not provide assistance or do not know how the lifts work. Drivers do not wait for passengers to settle in before going again, with the ensuing high risk of falling. If the driver goes too fast, people in wheelchairs can tip over.
- Inconvenient to have to give several days' notice that you wish to travel.
- Barriers due to orientation and knowing one's location, for example: knowing which bus to take, if the bus number or platform has changed inside the station, etc.

- Non-accessible vending machines, platforms and apps.
- Lack of sign language communication options.
- Need for panels with travel information.
- Autonomy is impossible for the visually impaired.
- There is no information in accessible formats.
- There are some people who have had positive experiences when traveling by this means of transport, especially after moving to a different province or region.

Most of the people without disabilities reported encountering no barriers

For the eleventh question, one of the most important, we obtain the Graphs 2 and 3:

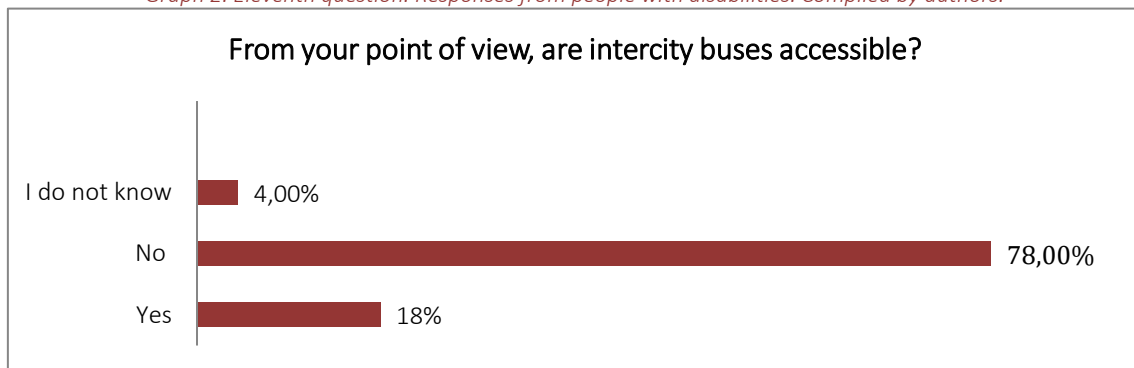
In the twelfth question, the respondents sent us proposals for changes that they would include to make buses accessible; specifically, people with disabilities commented that:

"All the bus fleet adapted"; "Option of validating the ticket through the middle door and not having to go to where the driver is"; "Information panel in sign language and subtitled"; "Guidance system and bus identification"; "Not having to provide notice before traveling".

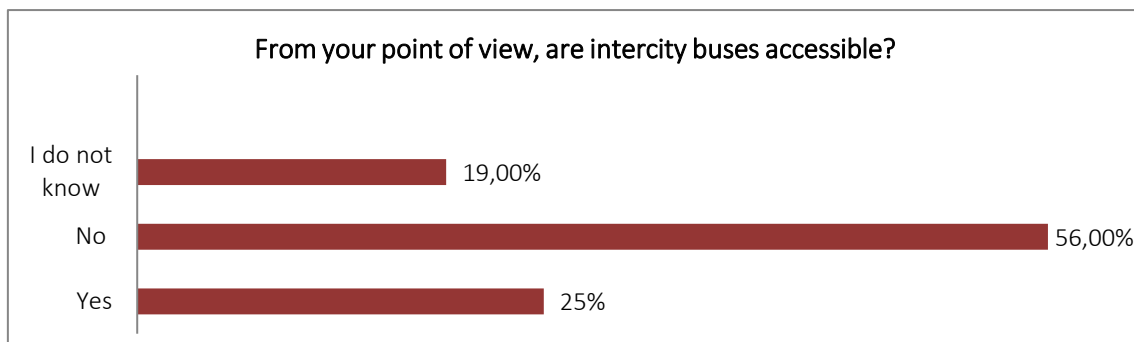
And people without disabilities: "Improve universal accessibility"; "Only on high-demand buses".

With the next question, the number thirteen, we analyse the accessibility of bus shelters, stops and stations, yielding graphs 4 and 5. The "No" answer continues to be the majority, but in this case the percentages are closer.

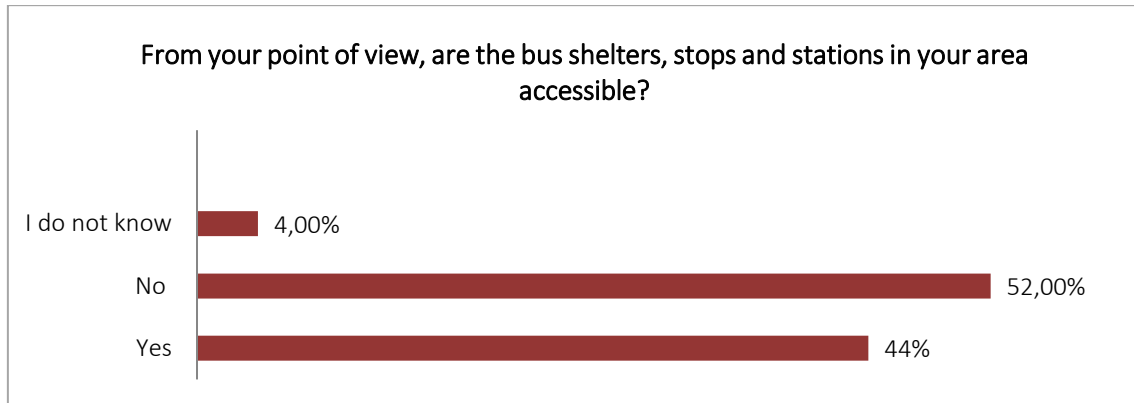
Graph 2. Eleventh question. Responses from people with disabilities. Compiled by authors.



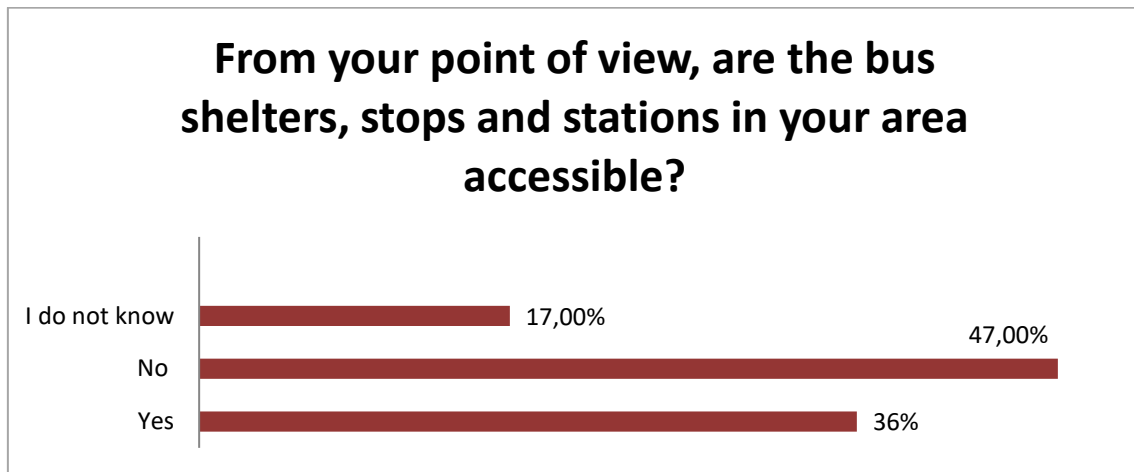
Graph 3. Eleventh question. Responses from people without disabilities. Compiled by authors.



Graph 4. Thirteenth question. Answers from people with disabilities. Compiled by authors.



Graph 5. Thirteenth question. Answers from people without disabilities. Compiled by authors.



The fourteenth question asked about proposals for actions to achieve accessibility in bus shelters, stops and stations. With regard to the responses from people with disabilities, we highlight the following comments: "Some are being renovated and made accessible"; "Information in Braille"; "Accessible information panels"; "Fixing them, something so simple"; "Seating at various heights".

And people without disabilities: "Remove the parking spaces right in front of the stop"; "Lack of accessibility for the blind"; "Not enough lighting when getting off at the platform in front of the stop".

In the next question, the number fifteen, we focus on the accessibility of bathrooms in the stations, another link in the accessibility chain. The resulting graphs are 6 and 7. The results allow us to conclude that the bathrooms are the most advanced area in terms of accessibility of the three areas we have dealt with: rolling stock, bus stations/shelters/stops and bathrooms.

In the sixteenth question, the respondents offered solutions and ideas for implementing accessibility in the restrooms.

We begin with the people with disabilities, who sent us the following comments: "I often find the adapted bathrooms in bus stations quite dirty, with the grab bars placed in appropriate places or even without them, with the automatic lights going off unexpectedly and leaving you in the dark"; "Sometimes it is better to go to an adapted bathroom in a public place or a nearby cafeteria outside the station"; "An adapted toilet in each station"; "Many times they are used for storage";

"I would add some inclusive changing tables in some stations, or toilets with folding bars, toilet at a good height or that can go up and down"

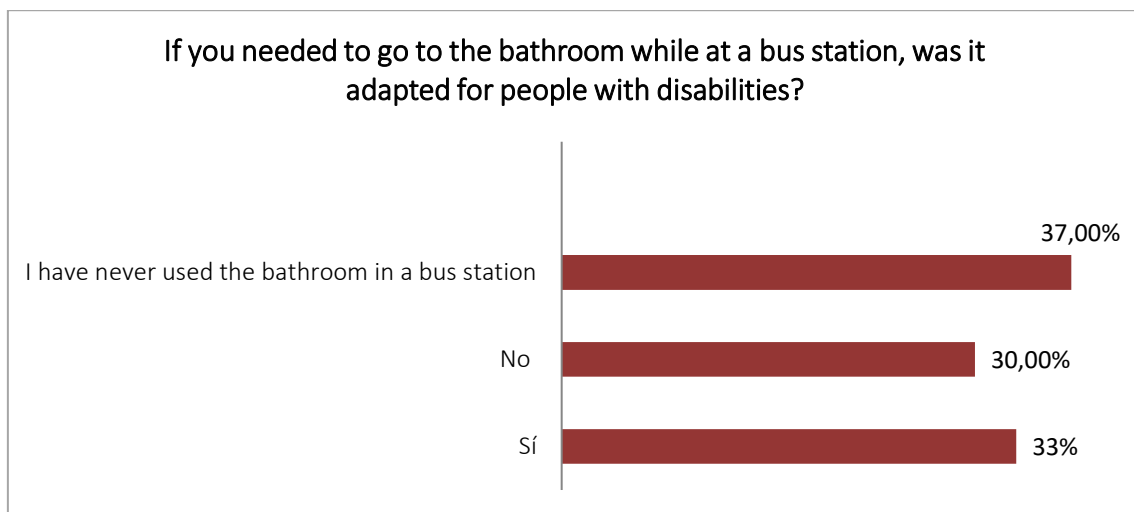
People without disabilities commented that: "Not necessary to ask for the key"; "Place them in an area closer to the platforms and in a visible position"; "Not available".

In the seventeenth question, we asked directly about the type(s) of accessibility most present in the buses. The answers are shown in graphs 8 and 9.

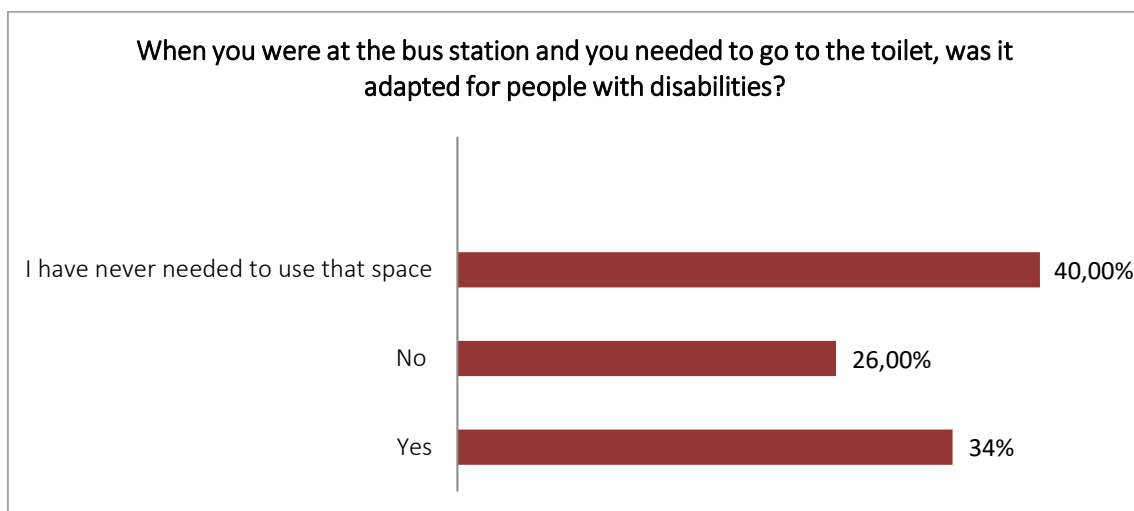
Both graphs follow the trend of prioritizing physical accessibility over cognitive accessibility (largely forgotten). However, we found a quite remarkable disparity in the percentage associated with the answer "None", as people with disabilities are more critical and describe a more complicated situation, while people with disabilities have a less strong opinion. Perhaps, it is because the first group suffers more severely the consequences of the lack of accessibility, and they are indirectly indicating that there is no Universal Accessibility.

This question is very important to our analysis of the current situation, since what many passengers perceive and suffer from is a lack of accessibility in this type of transport, meaning there is still a long way to go.

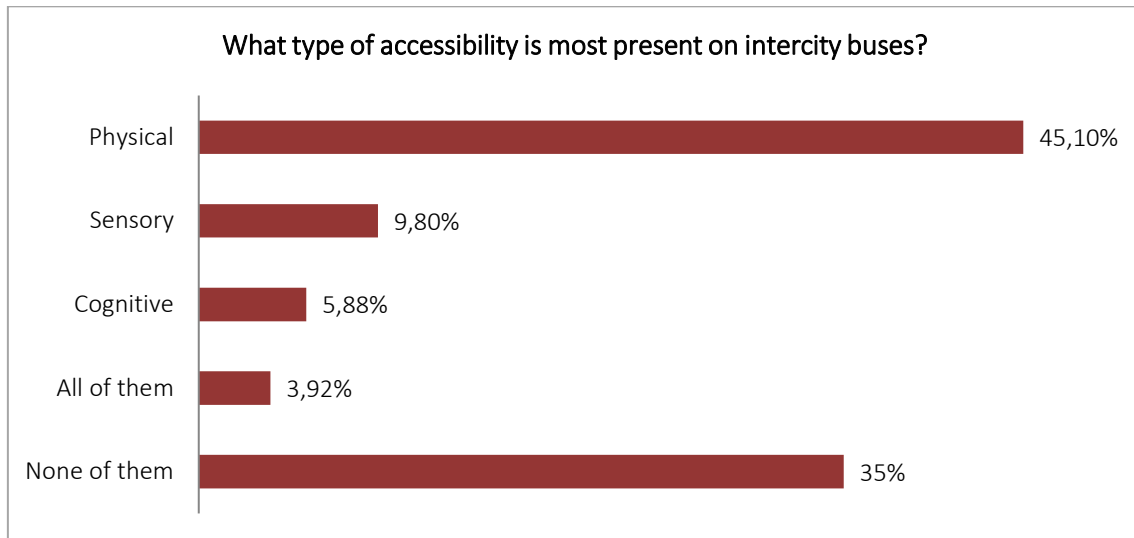
Graph 6. Fifteenth question. Answers from people with disabilities. Compiled by authors.



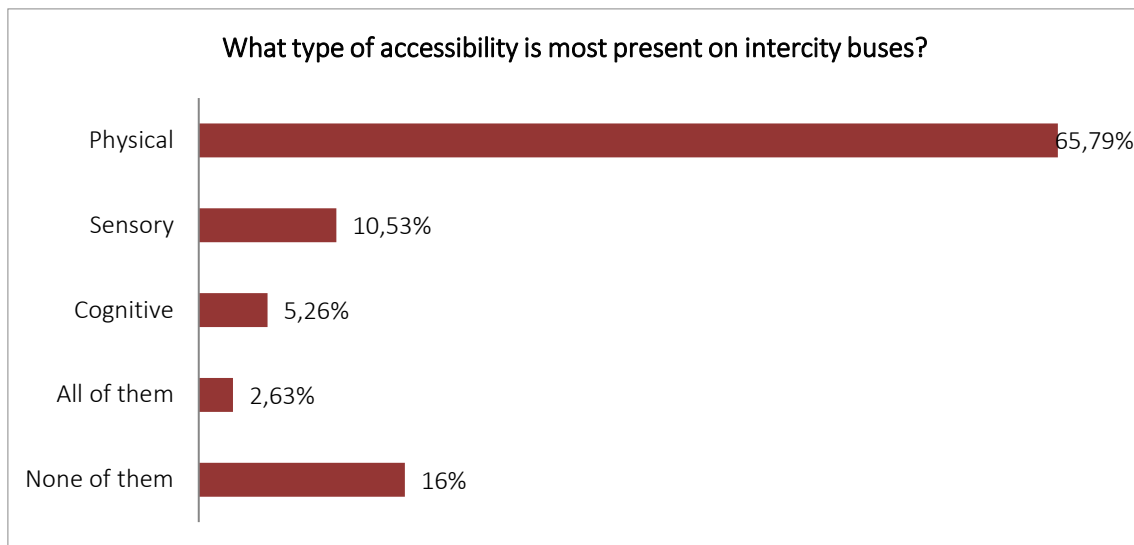
Graph 7. Fifteenth question. Answers from people without disabilities. Compiled by authors.



Graph 8. Seventeenth question. Answers from people with disabilities. Compiled by authors.



Graph 9. Seventeenth question. Answers from people without disabilities. Compiled by authors.

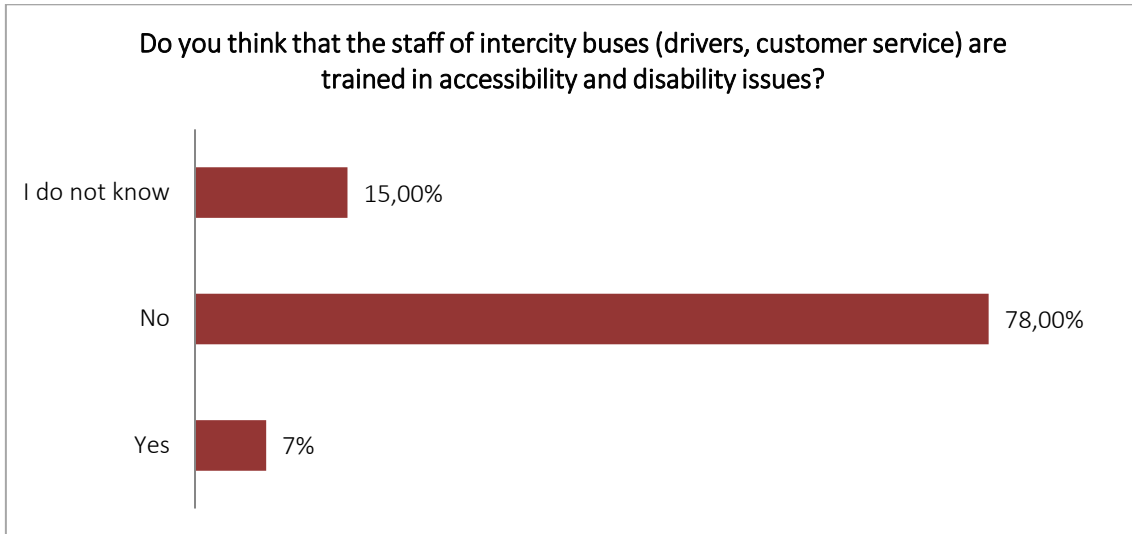


In the nineteenth question, we focus on whether or not personnel in the sector have received training on disability accessibility, a key point to offer a quality service that is often ignored. The resulting graphs are 10 and 11. In both groups, the percentages are very high. We believe this is due to the respondents' own experiences in terms of the inadequate service received, and to a lack of knowledge in terms of whether or not the personnel have received this training and are not putting it to use, or if the training is not adequate.

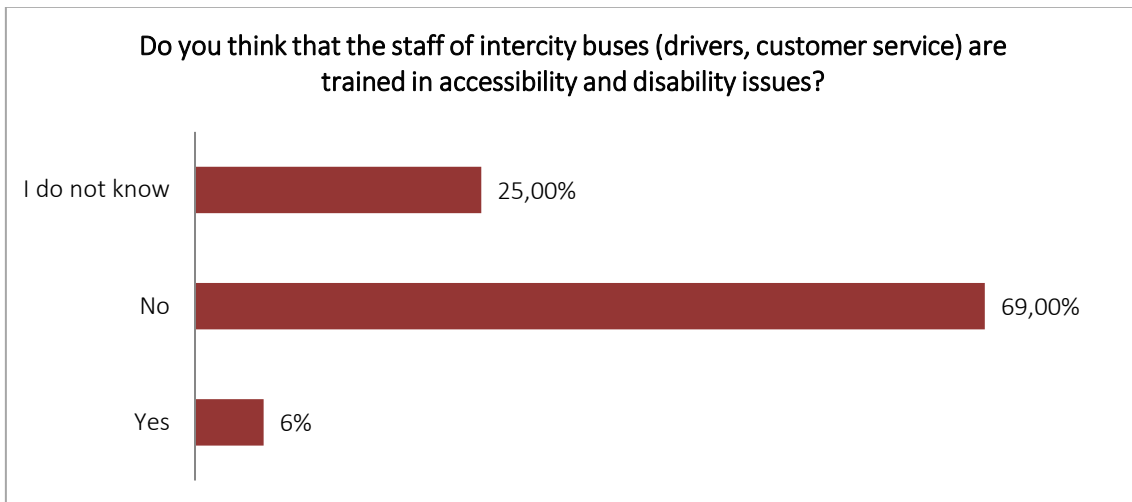
In the twentieth question, we asked their opinion of the "personal assistance" service for certain groups and the response was overwhelming, as shown in graphs 12 and 13.

As previously mentioned in the accessibility chain section, this service must be urgently implemented, as it is crucial for many people to decide whether or not to travel by this means of transport. This service should not be viewed as providing assistance, which entails a lack of autonomy in people; it is quite the opposite, what this service provides is the necessary support to carry out an activity as essential as traveling.

Graph 10. Nineteenth question. Answers from people with disabilities. Compiled by authors.



Graph 11. Nineteenth question. Answers from people without disabilities. Compiled by authors.

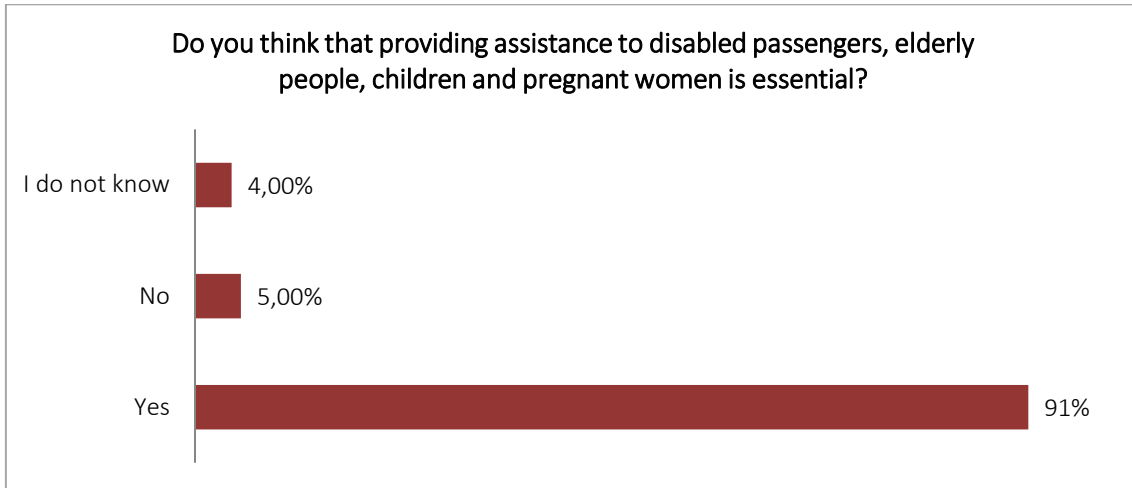


Support should be understood as rights and be defined as part of the needs that each person or group has, whether it involves a pregnant woman, an elderly person or a person with a visual impairment.

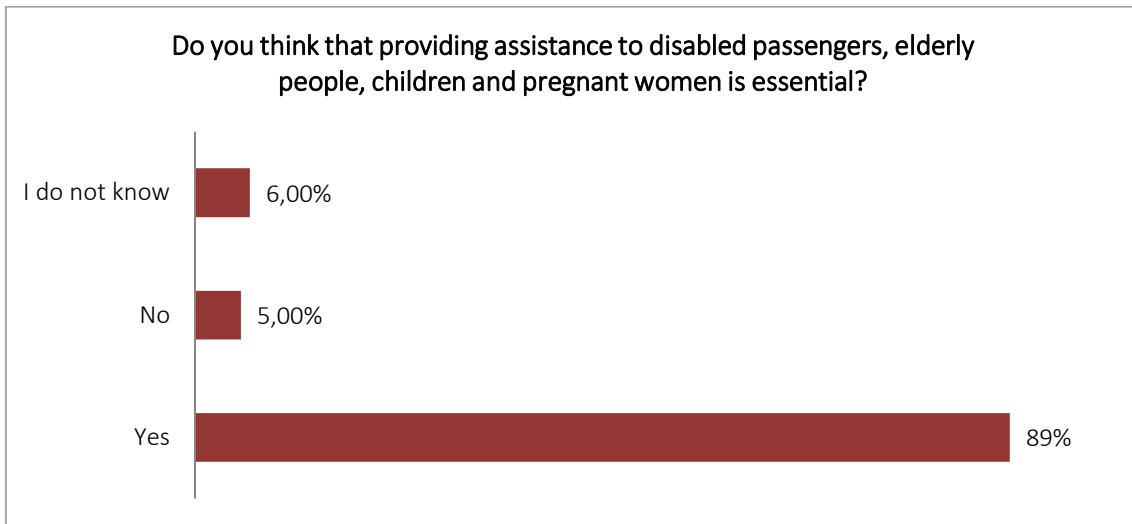
In the twenty-first question, we wanted to focus on the positive aspects that this means of transport and, ultimately, mobility can bring us. The responses and their percentages are shown in graphs 14 and 15. These percentages highlight the importance of autonomy for all people, regardless of their disability.

In the penultimate question, the number twenty-two, we asked for their thoughts, and we were taken aback by the answers. We highlight the following, which will help all of us to have a broader and more critical view of this problem and that will stir our conscience when we read them.

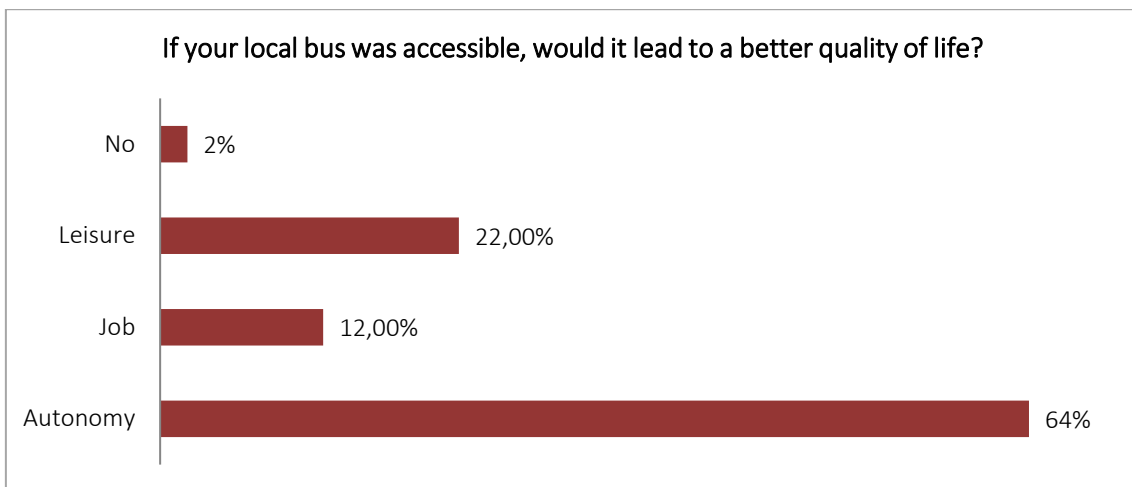
Graph 12. 20th question. Answers from people with disabilities. Compiled by authors.



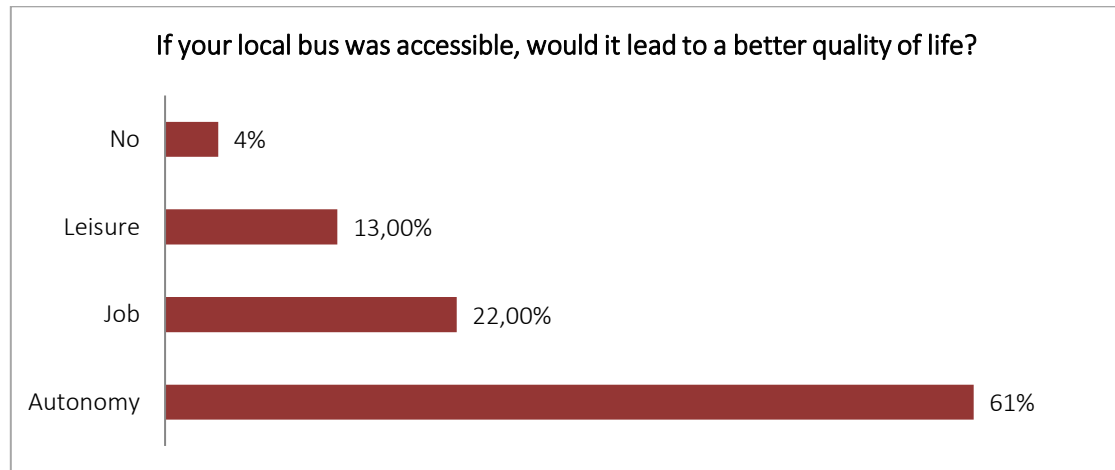
Graph 13. 20th question. Answers from people without disabilities. Compiled by authors.



Graph 14. Twenty-first question. Answers from people with disabilities. Compiled by authors.



Graph 15. Twenty-first question. Answers from people without disabilities. Compiled by authors.



On the one hand, among the group of people with disabilities, we highlight the following:

- "Universal Accessibility should not be limited to groups with disabilities; rather, it should always be present in every facet of any type of plan, since it is part of every area of life and is beneficial for the whole of society; if something is accessible, it can be used without help from third parties".
- "There is a lot of talk about the integration of people with disabilities, but there is no investment in the accessibility of public transport to achieve said integration."
- "Much remains to be done."
- "Fewer problems, more opportunities for participation."
- "More accessibility in everyday life for all people."
- "We must raise awareness mainly among the officials who have a role in adopting inclusion and accessibility measures in all areas; to give them the political will."

For people with disabilities, we highlight these two reflections:

- "With accessibility we all win, people with and without disabilities. If we increased the frequency and quality of public transport services, we would use them more and save money. With a good public transport service, private transport would not be so necessary and the environmental impact would be lower."
- "Some bus companies (such as AUCORSA in Cordoba) are working on staff awareness and adaptation, both of buses and bus stops, but there is still a long way to go. The important thing is to be aware that accessibility is not only physical, but cognitive, visual and auditory as well."

4. Discussion

Having presented the results of the survey, we now proceed to analyse and interpret them. To do so, we will answer three questions about this means of transport:

- Can it be used by everyone?
- Can all citizens benefit from this mode of transportation?
- Can Universal Accessibility be said to exist?

The data indicate that the answer to all three questions is a resounding no. The respondents generally pointed to the presence of multiple barriers and obstacles that should be urgently considered by government agencies and companies in the sector. Unfortunately, the current situation of this means of transport is that it is not a service that is prepared for the needs of all. Although significant advances have been made, which we acknowledge, they are still far removed from the ultimate goal of Universal Accessibility.

We realize that in order to have a more accurate picture of accessibility in this means of transport and to include a variety of opinions, reflections and experiences, it would have been better to have obtained a larger number of responses and to have reached more groups in order to obtain more pluralistic results. But our resources were limited and we wanted to offer an initial approach to the problems involved in this subject that other people can use as a foundation to undertake more exhaustive research in the near future.

5. Conclusions

At this point, and having reviewed the subject in depth, we conclude that there is still a long way to go to make this means of transport accessible and usable by all citizens.

There are groups that cannot access it, even though it is a public service. This could be defined as discrimination against them. As we have explained in several sections, transport is a right, and so is accessibility, so no one can be deprived of it because of their disability, age, physical condition or personal situation.

It is true that progress has been made, as mentioned above, especially in actions focused on physical accessibility. However, there is a great deficiency in the remaining components that make up Universal Accessibility. In addition, until these actions are implemented on every bus, we will not be able to declare this mode of transport accessible.

Why is the same effort not being made to address visual, cognitive and auditory impairments as with physical impairments? We believe that the main reason is a lack of knowledge of what actions to take, but there are experts and the affected individuals themselves (citizen participation) who can help in this process of transforming a conventional bus to an accessible one.

We would also like to emphasize that without the involvement of every agent, company, citizen and government agency, the great challenge posed by the bus sector will not be met. Therefore, it is necessary to invest economically in implementing all the necessary accessibility measures, and to realize that if this is not done, a quality service will not be provided. When we talk about investments, we are not only referring to rolling stock, but also to bus shelters, stops, stations, staff training, offering the possibility of travel assistance; in short, all the links in the Accessibility Chain that make up this service.

The survey revealed very important ideas that will surely make us all reflect upon and acknowledge the needs of those who do encounter barriers. The result of this will be a more empathetic and supportive society, which will lead to public services for everyone.

We have to consider that any of us at some point may be in a situation of dependency, and we would need our environment to adapt to us, not the other way around. With this work we wanted to emphasize this idea that people should not have to change anything in their personal situation to access essential services, such as transportation. If this service is not adapted to the diversity of citizens, there is clearly something wrong and it must be solved quickly.

We would like to close this research project with the following sentence: "To include is not to let in, but to welcome", by Ana García Sánchez.

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How to cite this article

Dueñas, C., Verdejo, A., De la Fuente, Y. M. (2024). Universal Accessibility in regular bus lines in Spain. *Journal of Accessibility and Design for All*, 14(1), 85-109.
<https://doi.org/10.17411/jacces.v14i1.376>.



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