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Accessibility and mobility deficiencies of line 2 RUTA, case of San Ramón, Puebla

Deficiencias de accesibilidad y movilidad de la línea 2 RUTA, caso colonia San Ramón, Puebla

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Abstract

Deficient accessibility and mobility conditions can create exclusion, which is why, when planning a mass transport system, it is necessary to analyse them at the neighbourhood level in order to guarantee the right to the city and access to public transport. The objective of this article is to show how the deficiencies of urban accessibility in line 2 of the RUTA system, in the case study of the San Ramón colony, Puebla, since the necessary pedestrian infrastructure conditions were not considered, which causes difficulties in pedestrian mobility to access public transport. This situation was confirmed by the disappearance of the urban routes that provided transport services in the colony. The action-research methodology was implemented through successive approaches in the theoretical, physical-spatial and legal spheres. The analysis was carried out through the application of a diagnostic instrument to evaluate urban accessibility, workshops with focus groups to identify the perception of inhabitants and users, interviews with key actors and multilevel matrices of legal instruments, with the aim of making recommendations that include participatory management.

Accessibility, Mobility, Articulated transport system

Resumen

Las deficientes condiciones de accesibilidad y movilidad pueden ser creadoras de exclusión, por esto, cuando se planifica un sistema de transporte masivo, es necesario analizarlas en la escala barrial con la finalidad de garantizar el derecho a la ciudad y el acceso al transporte público. El objetivo del presente artículo es mostrar cómo las deficiencias de accesibilidad urbana en la línea 2 del sistema RUTA, en el caso de estudio de la colonia San Ramón, Puebla, ya que no se consideraron las condiciones de la infraestructura peatonal necesarias, lo que ocasiona dificultades en la movilidad peatonal para acceder al transporte público. Esta situación se aseveró con la desaparición de las rutas urbanas que prestaban el servicio de transporte en la colonia. Se implemento la metodología de investigación-acción a través aproximaciones sucesivas de los ámbitos teórico, físico-espacial y legal. El análisis se realizó a través de la aplicación de un instrumento diagnóstico para evaluar la accesibilidad urbana, talleres con grupos focales para identificar percepción de los habitantes y usuarios, entrevistas a actores clave y matrices multinivel de instrumentos legales, con la finalidad de hacer recomendaciones en donde se incluya la gestión participativa.

Accesibilidad, Movilidad, Sistema de transporte articulado

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Introduction

Cities are configured in the places where people live, work and carry out various activities. Latin American cities from the 90s present characteristics such as urban expansion through horizontal growth of the peripheries (De la Hoz Sánchez & Monzón de Cáceres, 2009). This process required various modes of transport on foot, bicycle and public transport by the population to carry out activities (Vasconcellos, 2010), since decentralized cities represent a greater number of trips, greater distances in transfers and dependence on the car (Guerrero, 2014).

Urban growth in metropolitan cities has required modifying public transport and orienting it towards a mass transport model that allows the transfer of a greater number of users more quickly, such as the Bus Rapid Transit (BRT) Guerrero (2014). Examples of the implementation of this model are some cities in the metropolitan areas of Mexico defined from the intermunicipal conurbation, where the need for a mass transportation system increased, such as the metropolitan area called Valle de México and the metropolitan area Puebla- Tlaxcala, Zamudio & Alvarado (2015) and (2018). Particularly in the city of Puebla, which has a horizontal growth, in the southern periphery there are urban settlements lacking in services, infrastructure and urban facilities. Such is the case of the San Ramón neighborhood, it was built in 1985 and currently has a population of 6,149 people (INEGI, 2015).

The implementation of a mass transportation system Urban Articulated Transport Network (RUTA) in the city of Puebla in 2013, was carried out in order to be an integrated, safe, accessible, efficient and quality transportation system.

However, it also increased the difficulties of pedestrian mobility due to the deficient conditions of accessibility to public transport. The system consists of three trunk lines oriented from north to south and from east to west. In particular, line 2 was implemented in 2015 and runs through the city from north to south, is located on avenida 11 sur and is structured in 34 stations, a Metrobús line with a length of 13.8 km, and feeder routes.

The San Ramón neighborhood was affected by the implementation of this line, due to poor urban conditions and the lack of pedestrian infrastructure, coupled with the withdrawal of urban routes and thus the waiting times to board the RUTA system were increased. distances from homes to access public transport. Therefore, the problem of a low planning of the RUTA system is identified, in which it was omitted to consider the pedestrian infrastructure to access the public transport system, which causes difficulties in pedestrian mobility. The neighborhood has deficiencies in urban accessibility conditions such as dirt roads, deteriorated sidewalks, and urban obstacles such as changes in the level of the sidewalks, noxious vegetation and light poles.

It is hypothesized that the poor urban conditions that affect pedestrian mobility could be solved through participation mechanisms that help improve the accessibility and mobility of the neighborhood.

Development of Sections and Sections of the Article with subsequent numbering

This article is made up of three sections: the first section shows a theoretical framework in which theoretical references such as Gutiérrez (2013) and Carpio (2014) were reviewed that help to define the mobility paradigm and the principles of accessibility, from the right to the city approach. In the second section, the diagnostic analysis and evaluation are presented by means of an instrument of urban accessibility conditions in the case of study. In the third section, citizen participation workshops were applied with the inhabitants of the colony to identify the perception of accessibility and mobility to the RUTA system. Finally, the conclusions of the research work are presented.

Methodology

The methodology used in this work was Action Research under the approach through successive approaches to the three fields of theoretical, physical-spatial and legal study. The method of documentary analysis was applied through a theoretical review of the principles of accessibility, the paradigm of mobility and public transport from the perspective of the right to the city.

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A diagnostic analysis of the conditions of urban accessibility and pedestrian mobility was carried out through field trips, spatial analysis with Geographic Information Systems, and an evaluation was carried out through an instrument designed based on the Mexican street manual. For the analysis of those involved, workshops were held with focus groups of inhabitants, students and members of the board of directors in order to identify the perception of mobility and accessibility of the inhabitants.

The importance of accessibility to public transport

Mobility has been understood as a practice that allows people to move from one place to another, allowing people to access goods and services, in addition to the different land uses of the territory that are specified in the needs of the inhabitants (Gutiérrez, 2013). The operation of the city is closely related to social, economic and political structures, this operation is called urban dynamics, and it is made up of three dimensions: physical, moral and functional (Jiménez, De Hoyos, & Álvarez, 2014). The physical dimension refers to what is built in an urban environment such as the uses of land, infrastructure and equipment; the moral or technical dimension refers to all regulatory frameworks and planning instruments; and the functional dimension refers to the activities that the inhabitants carry out (Jiménez, De Hoyos, & Álvarez, 2014).

Urban dynamics allows analyzing, making proposals and public policies that improve planning and operation schemes in mobility and accessibility issues. Accessibility has been conceived as the ability of people to overcome distances that separate places (Gutiérrez, 2013), hence the importance of providing public transport nodes with pedestrian infrastructure in order to guarantee accessibility to public transport. Faced with inequalities in ease of access and mobility, the term multi-accessibility ensures more democratic environments that allow citizens to exercise the right of mobility (Carpio, 2014). At the international level, based on the new urban agenda of UN Habitat III, Mexico seeks to promote, from its planning instruments and laws, the principle of the right to the city through equitable access to housing, goods and services, as mentioned above. continuation.

Create and inhabit fair, safe, healthy, accessible, affordable, resilient and sustainable cities and human settlements, to enshrine this ideal, known as “the right to the city”, in its laws, political statements and charters. (United Nations on Housing and Sustainable Urban Development, 2017, p. 19)

The purpose of Mexico's New Urban Agenda is to promote urban planning based on safe and accessible mobility for all, and in turn a transportation system that provides a relationship between people, goods and services (United Nations, 2017). Likewise, that prioritizes attention to the needs of people, mainly those who are in vulnerable situations such as women, children, the elderly and people with disabilities.

It is important to improve proximity accessibility, according to De la Hoz Sánchez & Monzón de Cáceres (2009), since mobility does not understand administrative borders; In other words, it goes beyond the neighborhood, metropolitan and regional limits, the inhabitants develop in a fragmented and diffuse territory, which represents territorial inequalities. For this reason, urban development plans must focus on proximity mobility that prioritizes the use of public transport and that facilitates active mobility, in addition, the nodes of public transport accessibility must be analyzed, which considers the quality of the road infrastructure.

Urban planning of the BRT transport system oriented to neighborhood accessibility

Urban growth has oriented public transport towards mass transport in order to increase the capacity of users more quickly in transfers. In the last decade, Bus Rapid Transit (BRT) have been introduced in metropolitan cities because they combine capacity with speed, since they have exclusive lanes that facilitate their flow. It is important that in the planning of BRT systems the conditions of the pedestrian infrastructure are considered, evaluating the environment of public transport stations (Guerrero Contreras, 2014), in order to create accessible environments, the importance of evaluating two fundamental elements.

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First, define the delimitation of an area of influence with a range of 400 to 800 meters (Junping, Wang, Kenneth, & Bo, 2016, p. 18; Gutiérrez & García Palomares, 2008; François Raulin, 2020) to determine an environment pedestrian, which is used for the analysis of public transport nodes and is related to equipment and land uses.

In an urban environment, it is important to highlight the use of residential land that is intended for housing in order to guarantee access to public transportation. Second, an analysis of the conditions of the sidewalks, urban furniture, public lighting, vegetation, and other factors that influence the behavior of pedestrian mobility (Gutiérrez & García Palomares, 2008). In addition, another element that must be considered has been identified as urban obstacles, understood as infrastructure (poles and wiring), urban furniture (garbage cans and telephone booths) and vegetation (trees and undergrowth) that obstruct and hinder pedestrian mobility.

The planning and implementation of a mass transportation system must consider an analysis of accessibility around the stations or nodes of public transportation from the urban scale to the neighborhood scale. Where they are equipped with urban elements and infrastructure that allow pedestrian mobility of the inhabitants to the public transport stations. Therefore, there must be a fluidity in the infrastructure from the different scales, to guarantee accessibility (Junping, Wang, Kenneth, & Bo, 2016).

Urban accessibility index

The analysis in the different territorial scales allows to evaluate the degree of accessibility to the urban environment that the inhabitants have. On the urban scale, the degree of accessibility for pedestrians to the equipment and infrastructure that a city has can be measured, while on the neighborhood scale, the quality and comfort of the pedestrian infrastructure at the level of blocks can be evaluated (Esquivel, Hernández, & Garnica, 2013). The 5 D model is a theory that has helped the design of BRT transport through the accessibility indexes: density, diversity, design, destination and distance, in order to evaluate the neighborhood environment for pedestrian mobility (Junping, Wang, Kenneth, & Bo, 2016).

Density is understood as the amount of population in an urban or neighborhood environment that is sought to be served or planned (Junping, Wang, Kenneth, & Bo, 2016). Diversity refers to the balanced combination of equipment, land uses and services in a city, mainly in areas destined for housing since, if this diversity is not fulfilled on a neighborhood scale, it means repercussions on mobility (Junping, Wang, Kenneth, & Bo, 2016). The lack of services and equipment increases the number of trips, inside or outside the neighborhood (Ewing & Cervero, 2001). The design refers to those elements of the public space that facilitate pedestrian mobility such as wide sidewalks, lighting and vegetation (Gainza & Iker, 2014).

The destination is understood as the accessibility that destinations have to reach it, which are favored with the combination of land uses, urban design, pedestrian and cycling infrastructure; In general, peripheral neighborhoods have no accessibility, due to discontinuities in the urban fabric and the lack of pedestrian infrastructure (Junping, Wang, Kenneth, & Bo, 2016). Distance refers to the distance to public transport, which not only symbolizes the distance that people must travel to board public transport, in turn implies the integration of various modes of transport (Ewing & Cervero, 2001) (Junping, Wang, Kenneth, & Bo, 2016) (Gainza & Iker, 2014) (see, Figure 1).

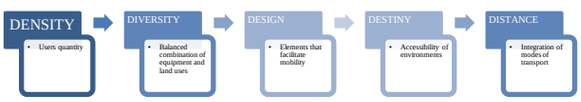

Figure 1 5D model
Source: Own elaboration based on Junping, Wang, Kenneth, & Bo (2016)

It is important to consider the 5D model in the planning of a mass transportation system, at different territorial scales, in which the needs of the inhabitants are recognized to build accessible and appropriable urban environments. In this process, evaluation and participatory management are essential to improve the quality of public space to access public transport in neighborhoods. Participation requires various methodological tools and the involvement of actors as a management instrument (Segovia & Dascal, 2000).

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Mobility before the RUTA system

Before line 2 of the RUTA, the inhabitants of the San Ramón neighborhood traveled through urban routes such as: the Santa Clara route, the 34 route and the Galgos del sur route, with its different branches such as: San Ramón 4th section, Ramón 3rd section and Colosio (see, Figure 2). As of the implementation of the RUTA system, the state government withdrew the urban routes, they were replaced by the feeder routes of the system, which did not retain the same route as the previous ones, the distance between the stops of the feeder route increased up to 1.3 km, compared to urban routes. These changes in the routes have caused users to walk longer distances to board a feeder route and wait up to 20 minutes due to the infrequency.

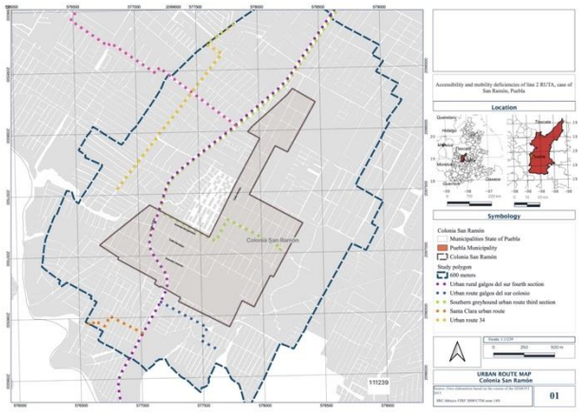

Figure 2 Urban routes before ROUTE
Source: Own elaboration based on the course of the SEMOVI 2015

Colonia San Ramón, poor accessibility

The San Ramón neighborhood is an urban settlement located on the southern periphery of the municipality of Puebla, it was built in 1985 (see Figure 3), the layout of the neighborhood is reticular and is made up of 131 blocks with a total of 2,847 homes, of which only 219 homes have cars (INEGI Population and Housing Census, 2010). In addition, it is adjacent to nine urban settlements such as Jardines de San Ramón, INFONAVIT San Ramón, Geovillas del Sur, Ciprés del Sur, Hacienda del Sur, Jardines de Juan Bosco, l Nuevo Plan de Ayala or also called Unidad Antorchista and Luis Donaldo Colosio, these last two are irregular settlements. In this neighborhood deficiencies are identified in the pedestrian infrastructure such as dirt roads, roads with discontinuous sidewalks and the presence of obstacles.

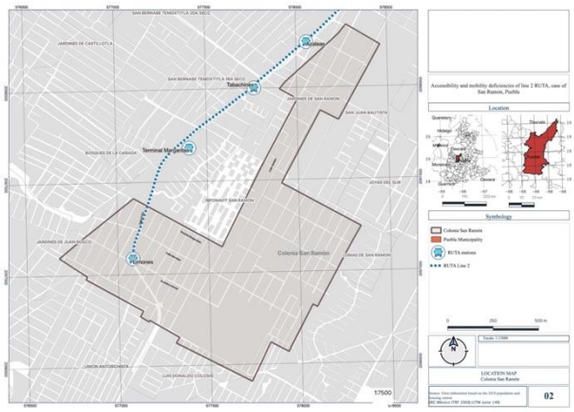

Figure 3 Location
Source: Own elaboration based on the State and Municipal Geostatistical Framework, INEGI, 2018

The conditions of pedestrian mobility in the streets of the San Ramón neighborhood were analyzed based on a diagnostic instrument that was designed to measure the degree of accessibility in the urban structure, it should be noted that the presence of the minimum elements of a road that allows universal accessibility. The instrument is divided into two parts, the first part determines the presence of elements that the roads have, which were classified into ten groups, elements of stationary activity, elements of universal assistance, elements of road safety, elements of connectivity, urban infrastructure, vertical signage, horizontal signage, road covering, green infrastructure and the presence of urban obstacles.

The evaluation was done through a binary system, which allowed to measure the presence of the elements in the road, this instrument was applied in all the roads of the San Ramón neighborhood, through the field trips. In the second part of the instrument, the conditions of these elements were evaluated through a binary system (see, Figure 4). The ten groups of the elements of analysis were broken down into subsections that allowed the evaluation of the conditions and degree of accessibility of the neighborhood's roads.

The elements of stationary activity, in stops and / or stations of public transport, were subdivided into three sections, in which they are evaluated: the signaling of the stops and / or stations, the minimum dimensions for the ascent and descent and the location of the stops in the mixed strip.

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In the elements of assistance and universal accessibility, three groups were reviewed: sidewalks, ramps for people with disabilities and tactile guides. On the sidewalks, it was evaluated that they were continuous, that they met the minimum dimensions, that they did not have obstacles that impeded or hindered mobility and that the slopes did not exceed 2% incline to guarantee pedestrian mobility. In the ramps for people with disabilities, it was evaluated that they had no obstacles and that the slopes did not exceed 2%. In the podotactile guides, they were evaluated that they were continuous on the roads and that they did not present obstacles.

The elements of road safety in which the traffic lights and garrisons were evaluated. The traffic lights of public transport and automobile traffic lights of which the functionality was evaluated were considered. The gaskets were evaluated that they were in good condition, that is to say that they were not broken and that they were painted.

The connectivity elements were considered the exclusive public transport lanes, it was evaluated that they had confinement elements and that they had horizontal signage. Regarding vertical signage, four elements were evaluated such as nomenclature, preventive, restrictive, informative signs, in which readability was evaluated. The horizontal signaling five elements were evaluated: presence of school zone 30, stop line, line of direction of movement, line of pedestrian crossing, line of cyclist crossing.

In the urban infrastructure, the public lighting was evaluated that the luminaires were maintained and functional, and the presence of drainage and sewerage. The roads were evaluated for having some type of asphalt or hydraulic concrete coating, and it was evaluated that it was homogeneous and that it did not show deterioration. In the green infrastructure, the presence of trees or shrubs that provide shade and are a plant barrier was evaluated.

The results of each element were added in natural numbers and became the percentage of accessibility of the roads, 100% represents the presence of all urban elements and in good condition.

The evaluation of the accessibility conditions to the urban structure of the neighborhood was applied to 114 roads (100%). The results obtained from the diagnostic instrument were classified based on an accessibility scale according to the highest value obtained, and from this they were grouped into five types: in a range of 60% to 100% it is very accessible, It is important to mention that none of the roads in the neighborhood belongs to this typology, from 45% to 59%, it is accessible from 30% to 44%, it is moderately accessible, from 15% to 29% it is low accessibility, and 0% at 14% it is very low accessibility; (see, Table 1).

Diagnosis of accessibility to the urban structure		Local road Nardos Street YES (1)	NO (0)	SUM	%	Evaluation
Stationary activity elements	*Public transport stops and / or stations*	1		1	11%	12% VERY LOW ACCESSIBILITY
Elements of assistance and universal accessibility	*Sidewalks, ramps for people with disabilities and tactile guides*	1		3	30%	
Road safety elements	*Traffic lights and garrisons*	1		2	50%	
Connectivity elements	*Exclusive public transport lanes*		0	0	0%	
Urban infrastructure	*Lighting, drainage and sewerage*		0	0	0%	
Vertical and horizontal signage	*Zone 30, stop line, pedestrian crossing and bicycle crossing line*	1		1	20%	
Coating of the road	*Asphalt or hydraulic concrete pavement*		0	0	0%	
Green infrastructure	*Presence of trees and / or shrubs*		0	0	0%	

Table 1 Diagnostic instrument of accessibility to the urban structure
Source: Own elaboration based on the manual of streets of Mexico, SEDATU (2019).

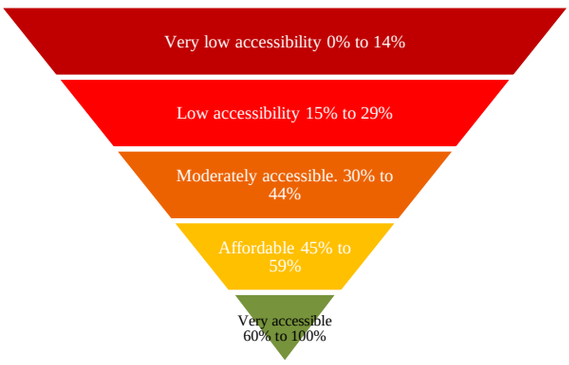

Figure 4 Scale of accessibility to the urban structure
Source: Own elaboration based on the results of the diagnostic instrument of accessibility to the urban structure of the San Ramón neighborhood

According to the results obtained in the accessibility scale, the roads of the San Ramón neighborhood were georeferenced, according to the typologies of: very low accessibility, low accessibility, moderately accessible and accessible. In the results obtained, out of 114 roads analyzed, which represents 100%, 66.66% are roads with very low accessibility, 12.28% are roads with low accessibility, 13.15% are moderately accessible roads and 7.89% are accessible roads. note that no very accessible roads were identified within the analysis (see, Figure 5).

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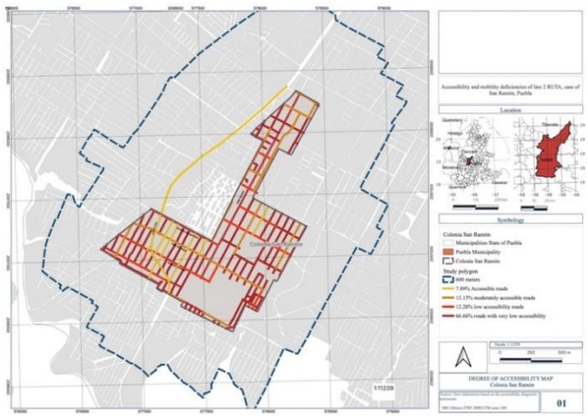

Figure 5 Degree of accessibility of the roads of the San Ramón neighborhood
Source: Own elaboration based on the results of the evaluation of the accessibility diagnostic instrument

The weak planning of the RUTA system

The planning of mass transportation systems must guarantee and ensure the access of the inhabitants to the different services and facilities of the cities, which is why the different legal and planning instruments were reviewed and analyzed from the metropolitan, state and regional levels. municipal that comprises the RUTA system, to identify the regulations and strategies that they propose has the instruments from the five categories of analysis density, diversity, design, destination and distance.

At the metropolitan level, it was identified that the Puebla-Tlaxcala Metropolitan Area Development Plan (2013) does not contemplate the categories of density and diversity, only the design, destination and distance that are included in the section on Metropolitan Mobility Policy. This instrument did not contemplate the development of a transportation system that facilitates the inter-municipal connection of the municipalities of the metropolitan area, and it is also a plan that has not been updated. In addition to this, the plan presents an inconsistency with article 36 described in the General Law of Human Settlements, Territorial Ordering and Urban Development (LGAHOTDU) (2016), since it proposes a coordination of the three levels of government and the participation of the civil society itself is not fulfilled.

On the other hand, there is a weakness in the disappearance of organizations such as the Metropolitan Area Planning Institute (IMEPLAN) since it can accentuate the mobility problems that the metropolitan area has, since there is no body that plans long-term strategies. deadline to improve infrastructure and access to services in the Puebla-Tlaxcala metropolitan area. In addition, the Council for the metropolitan development of this same area has not been able to define strategies for its development. Puebla's sustainable metropolitan development commission lacks specialized profiles in terms of land use planning, mobility and public transport, for this reason, despite its existence, no proposals have been made in favor of mobility and accessibility to public transport.

At the state level, Puebla, in the Transportation Law for the State of Puebla 2017, the presence of the five categories of analysis was identified where density refers to the right to the city in article 4, diversity in universal accessibility in article 4.1, the design of access to services in articles 103 and 115, the destination with the interconnection of equipment in articles 103 and 116, finally the distance in the interrelation of the urban centers mentioned in articles 116 y128. This instrument defines two competent authorities, which is the Secretariat of Infrastructure, Mobility and Transport and the decentralized body of Tolls Puebla in charge of RUTA, however, this law has focused on setting rates, granting concessions, and has not achieved an effective planning of public transport in coordination with the municipalities of the State, in order to achieve a metropolitan planning that benefits the greatest number of inhabitants.

At the municipal level the Municipal Development Plan 2018-2021, the five categories of analysis are present where the density of road users is present in strategy 1.2, diversity in strategy 4.4 use of public transport, design in strategy 3.1 and 3.3 safe and accessible infrastructure, the destination in strategy 4.1 in the orderly and connected transport network, and the distance in the infrastructure to integrate RUTA, however, it is in this strategy where deficiencies are identified that the RUTA system has such that only 11.7% of the stations have pedestrian infrastructure in their surroundings, and that 15,260 homes on the southern periphery have limited access to public transportation.

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The strategies that are proposed do not define a collaboration with various government entities, and the improvement of the pedestrian infrastructure is not contemplated and where universal accessibility is guaranteed.

The analysis based on the 5d model shows the disarticulation between the governmental bodies in the different territorial scales, which is reflected in the weak metropolitan planning in which the route system should impact and in which the citizens are considered and therefore to experts who have profiles specializing in mobility, accessibility and transportation issues. Faced with this lack of coordination at the state and municipal levels in Puebla, civil society has carried out various actions, an example of which is the reform of the articles necessary for Mexicans to have a general law on mobility and road safety. that have been formulated to recognize the right to mobility in conditions of road safety, accessibility, efficiency, sustainability, quality, inclusion and equality.

Towards a solution through a neighborhood organization

According to Segovia and Dascal (2000), citizen participation has the ability to influence decision-making in public affairs and contribute to the development of collective life and arises as a way to amend social problems or demands of public interest, as well It is understood as the involvement of people in decision-making and the degree of influence in matters of public management, such as local government programs.

That is why, to know the perception of the inhabitants, some social actors, focus groups, with inhabitants, students and members of the board of directors who were interviewed were identified. A physical and digital instrument was developed consisting of twelve questions, divided into three sections; the first is for the purpose of obtaining information regarding the occupation and age range of each group, the second is to identify the conditions of mobility, accessibility and transport systems of the colony and the reasons for the transfer, the last section has the purpose of know the opinion that the inhabitants have regarding the mobility of the colony, (see, Figure 6).

The results obtained are, 80% of the inhabitants use public transport and 20% travel on foot. It was also identified that the inhabitants put into practice the use of shared car, which is a palliative action that is considered not to solve mobility deficiencies but demonstrates an organizational structure in the neighborhood. 30% of students live in the neighborhood and 70% go to the neighborhood through the educational center. 50% of students use public transport, 5% use the bicycle as an alternative for mobility.

The inhabitants consider that "there are a lack of units, it is more expensive, they are always full, we have to wait a long time to get on public transport, I prefer that they return to the routes we had" (López, 2020). On the other hand, that "They need to pave the streets and put sidewalks so that we do not walk where cars pass, I prefer to use the shared car, it is faster and safer" (García, 2020). In addition, that “you cannot walk the streets, it is always dark when we get to school and there are no lamps and I have been mugged” (Marin, 2020).

Figure 6 Focus group with inhabitants
Source: Pérez, 2020

The work with the focus groups allowed to corroborate the deficiencies that the neighborhood has in mobility and accessibility to access public transportation, and practices such as the use of carpooling were identified. On the other hand, the presence of a board of directors that during its management period has carried out works that have helped to improve the mobility and accessibility conditions in the neighborhood, the presence of street representatives who are the direct communication between the residents was also identified.

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The inhabitants and the board of directors, however, need actions that generate greater impact, such as linking up with other civil organizations that address accessibility issues, in order to develop projects and proposals from management and participation. With what has been identified so far, it is necessary to articulate social actors with actions that help improve mobility conditions, since citizen participation is identified and the implementation of a participation mechanism is possible.

That is why a solution proposal to improve the accessibility of the neighborhood will be based on the diagnosis obtained from the instrument and the mechanism of participation with the focus groups, where proposals, strategies and actions are developed that give priority to the roads that were diagnosed as having very low accessibility. Some of the suggested proposals are: to form a committee in charge of managing the accessibility of the neighborhood, which must be made up of members of the board of directors and volunteer residents where short, medium and long-term strategies are formulated, such as carrying out cleaning campaigns of the roads on the hill in which the inhabitants participate, in order to remove obstacles from the roads that make accessibility difficult, such as weeds and garbage. Follow up on requests such as improvement of sidewalks, maintenance of public lighting, request for sidewalks, sidewalks and paving of streets presented to the Puebla City Council. This articulation of strategies and actions of the different social actors can help to contribute to the improvement of the accessibility of the neighborhood.

Conclusions

The disorderly and fragmented growth of cities has had a significant impact on mobility, particularly in terms of travel distances (De la Hoz Sánchez & Monzón de Cáceres, 2009). This urban growth has led us to think about BRT mass transport systems in metropolitan cities due to the need for units with greater user capacity and faster transfers, Guerrero Contreras (2014).

The San Ramón neighborhood is not alien to disorderly and fragmented urban growth, since it belongs to the periphery of the municipality and therefore presents some deficiencies in the pedestrian infrastructure, which were increased when a mass transport system called RUTA was implemented. These deficiencies were evidenced through a diagnosis of the accessibility conditions of the neighborhood where dirt roads, deterioration in sidewalks and low connectivity of these, noxious vegetation and urban obstacles were identified. These conditions cause difficulties in pedestrian mobility to access public transport, according to the diagnosis, 66% of the roads are of very low accessibility.

A review of the planning instruments, plans and programs was carried out from the territorial scales contemplated by the RUTA system, which are metropolitan, state and municipal, based on the application of the 5D model based on categories such as density, diversity, design, destination and distance, in order to identify the deficiencies in the instruments in the planning of the system.

In addition, a participatory process was carried out with the inhabitants of the neighborhood in order to corroborate and support the urban diagnosis, the existence of the neighborhood organization was identified where the inhabitants in a palliative way started the practice of shared car which aims to help to the mobility of the inhabitants, shortening distances to approach public transport, reduce waiting times, be safe, promote organization and not generate a significant cost in the cost of the passage, since it works with voluntary cooperation. Although, this practice does not solve the deficiencies of mobility and accessibility to public transport in the neighborhood, it shows the neighborhood organization structure that is present in the neighborhood, elements of participation in the different organizations were identified, such as the neighborhood organization and the board of directors, such as the practice of palliative actions of the inhabitants, actions and proposals of the board of directors. These elements are the basis for a participatory management that helps to improve the conditions of accessibility to public transport.

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Acronym

BRT - Bus Rapid Transit

INEGI - National Institute of Statistics and Geography

ROUTE - Urban Articulated Transport Network

LGAHOTDU- General Law of Human Settlements, Land Management and Urban Developmen

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