Characterization Of Bike Users UFPS

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Abstract

"Urban public transport can contribute to a greater well-being of people and a sustained development of cities" (Heredero, et al. 2012). Among these public transport systems are public bicycle systems, which directly improve the mobility of people. “Many cities around the world have adopted bike sharing systems, to offer an alternative to personal vehicles and classic public transport” (Leclaire & Couffin, 2018). "The most important benefits are: the reduction of investments in the control of environmental pollution and health systems, the improvement of urban mobility, the development of tourism, and other positive economic effects in cities” (Quintero, 2017).

The bicycle is one of the highly significant means of transport to mitigate the environmental impact in the world, for this reason the global trend is to create public bicycle systems to achieve more sustainable cities. In Colombia, the city that reports the largest number of trips per day is Bogotá, but it is Medellín that has the most important public bicycle system in the country, 3844 people are transported daily in the system, of which 20% are students, data that is similar to that found in the investigation, having what, 18% of the trips made to the UFPS are by bicycle, also with a usability index of 81%.

Keywords: Bike Users, sustainable mobility, characterization

Introduction

Public transport systems (PTS) are of vital importance for the sustainable development of 21st century cities, because they provide the matrix where the different productive systems of an economy converge. For decades, transportation has been regarded as a link to all aspects of life throughout the world. "In this case, the natural environment, social well-being and economic development of the world generally depend on transportation systems (Bamwesigye, 2019)."

In this order of ideas, the sustainable progress of a region is directly linked to the level of organization and the ability to connect production systems, with the vision of allowing the following generations an environment that is as healthy as possible. "In connection with the development of society and the intensification of international relations due to globalization processes, the importance of transportation as a factor for economic and social development has increased." (Skorobogatova, & Merlino, 2017) That is to say, thanks to the synergy of a SPT, a territory is influenced, which makes it an attractive subject of study in order to influence the improvement of the population's living conditions.
Urban logistics. "Urban logistics, also known as last-mile logistics, covers all movements related to commercial activity and the supply and distribution of goods in cities, which is why it is essential for their economic development" (Banco Interamericano de Desarrollo, 2015).

mobility. Mobility as a Service (MaaS) is a recent innovative transportation concept, which is anticipated to induce significant changes in current transportation practices. However, there is ambiguity around the concept; it is not clear what the main features of MaaS are and how they can be addressed. Furthermore, there is a lack of an assessment framework to classify its unique features in a systematic way, despite the fact that various MaaS schemes have been implemented around the world (Jittrapirom, Ebrahimigharehbaghi, et al, 2017).

Cycle seasons. For those who use the bicycle as their means of transport or for those who want to start doing so, a determining factor for using it towards a specific destination is the need for an intermediate destination and at the end of the route to have a place or parking for bicycles. safe and easy to use (ITDP, Despacio.org, 2013).

Method

In accordance with the objectives set for the development of the project, the research will be of a descriptive-propositive type, likewise this research will be of a mixed nature because it integrates qualitative research that will provide information (characterization and subsequent diagnosis) on the state of the floating population that he travels by bicycle to the UFPS, which will be obtained through surveys (origin-destination); and quantitative to analyze the data collected through surveys.

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<tr>
<th>Aspect</th>
<th>Description</th>
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<tr>
<td>Population</td>
<td>It is the group that includes all the elements whose characteristic or characteristics we want to study; In other words, it is the entire set that you want to describe or from which you need to draw conclusions. (Salazar P. &amp; Del Castillo G., 2018)</td>
<td>Floating population in the UFPS in the city of Cúcuta. 18,427 potential students to become bike users (Universidad Francisco de Paula Santander, 2016) UFPS. (30 of 11 of 2016). Count on me. Obtained from <a href="http://www.ufps.edu.co/ufps/cuenta_conmigo/presentacion.php">http://www.ufps.edu.co/ufps/cuenta_conmigo/presentacion.php</a></td>
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<td>Show</td>
<td>It is a set of elements selected from a population according to a previously established action plan (sampling), to obtain conclusions that can be extended to the entire population.(Salazar P. &amp; Del Castillo G., 2018) For the study, a convenience selection model will be used, since the population of bicycle users is not defined or characterized.</td>
<td>No.=555</td>
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<td>variables</td>
<td>A statistical variable is understood to be the symbol that represents the data or character that is the object of our study of the elements of the sample and that can take a set of values.(Gorgas García, Cardiel López, &amp; Zamorano Calvo, 2011)</td>
<td>Mixed</td>
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Instruments or techniques for collecting information.

primary sources. As a primary source, information will be collected with surveys, these will be applied to UFPS bike users.

http://www.webology.org
Secondary sources. Information provided by UFPS, in addition to all the information that was collected by the subscription bases of the Eduardo Cote Lamus Library.

Instruments. The survey is used for the collection of information; the survey must have a clear and concise structure for the effective collection of information. Digital Annex 1&2.

Analysis of the information.

Characterization & diagnosis

In this phase, primary information was collected, such as the inspection of the current UFPS bicycle system and the collection of information through the application of a survey-type instrument. The latter was carried out online with the support of the UFPS press office, which disseminated said instruments to the entire target population of this work.

1. Actors. Holistically, there are three main actors: the first is the population under study - UFPS bicycle users - but, within this context, UFPS is also an actor, since it manages and provides essential information. However, the population of bicycle users is characterized by its role within the university in the following way: administrators, students, security forces, graduates, teachers and visitors. It should be clarified that the object of study is the location of platforms throughout the city, for this reason the second actor is the municipal mayor's office, since it is the one that has the public spaces for a potential implementation. Finally, the private sector is taken into account, in case of resorting to locating platforms in a space belonging to it.

2. Resources. UFPS has 37 bicycles available only for students, in addition, as shown in the image (see figure 1), it has three parking stations, two of which are in service. Figure 1. UFPS parking stations.

The total capacity of the stations is 484 available spaces, which are distributed as follows: 281 in the main station located behind the Eduardo Cote Lamus library, 40 in the station created under the “en bici a la U” project, and 163 more in The parking lot located next to the motorcycle parking lot in Aulas Norte. This parking lot has some affected facilities, so its capacity may be greater (for the study, those enabled are taken). It should be noted that the parking lot next to Aulas Norte has not yet been put into operation, so the total for use is 321 parking stations.

3. Variables. For the collection of information, the population was surveyed virtually (this was done due to the declaration of quarantine due to a pandemic); however, this was achieved in collaboration with the UFPS press office, which sent the instrument to all institutional emails linked to the university. This, in order for the instrument to be filled out only by people included in the target population of this work. Within the instrument, questions were asked to solve the variables mentioned below:

- Role within the UFPS
- Means of transportation used by the UFPS population
4. Tabulation and analysis of the data. At a general level, among the 555 people surveyed virtually in the event of a national emergency, it is determined that 85.35% are students, 8.32% teachers and 6.33% are administrative staff, this shows that the student population is the most prevalent in the university (see figure 2).

Including the most used means of transport, it was found that the surveyed population prefers the use of public transport by 50%, in addition, that 18% prefer the bicycle as a means of transport and in a third place they prefer to walk; It is worth noting that the number of the population that uses private transport (motorbike and car) is considerable since they add up to 21% (see figure 3).
For the interpretation of the variable, a trip is considered to be a trip to the UFPS and back home. Taking into account that the UFPS has a restaurant service for the UFPS population, 50% make two trips a day. This correlates with the external agent that not all students are in the restaurant service, in addition, that the administrative staff normally make 2 trips, one on the first day and another on the second; in second place, a single trip a day with 39%, generally the students benefiting from the restaurant service, plus the students who only have class on one of the days. In atypical cases that are related to 3, 4 or more than 4 trips, they are related to professors who have different chairs in different universities, students who live near the university and are traveling more frequently than those usually used to comply with the different days (see figure 4).

This frequency demonstrates the activity by day of the week in the UFPS, as expected: business days are the most frequented and have a normal distribution behavior, as shown by the bar chart, with Tuesday as the highest peak, even so, it is shown that the UFPS is also in operation less frequently on Saturdays.
and Sundays, but that they are frequented, ruling out the thesis that the UFPS does not have its doors open on Sundays (see figure 5).

![Bar chart showing frequency per day](http://www.webology.org)

**Figure 5. Days frequented by part of the UFPS population**

The behavior of the Reason variable is similar to the data found in the role, but it causes us to take into account that not all students only go to UFPS to study, some are in degree work, others in practices etc. Added to this, the information regarding the administrators who study at UFPS also varies in relation to the role (see figure 6).

![Pie chart showing reason for trips to UFPS](http://www.webology.org)

**Figure 6. Reason for trips to UFPS**

It was possible to determine from which communes the trips to the UFPS originate, thus finding that 15% of the population mobilizes from commune 6, 11% mobilizes from the municipality of Los Patios, 10% from commune 8, 9% from communes 5 and 7, with 8% communes 2, 3, 4 and 9 respectively, however, with the lowest percentages are commune 10 and the municipality of villa del rosario, and finally with a total of almost 5% are the very infrequent commune 1, Puerto Santander and El Zulia (see figure 7).
The high degree of acceptance by the population surveyed with respect to wanting to use the bicycle as a means of transportation is affirmed (see figure 8).

Analyzing the acceptance for the use of the bicycle, we proceeded to determine the amount of population that has its own bicycle, the population with availability of its own bicycle was also determined with 32%, for which the willingness to use the proposal was investigated. BICI UFPS, for this the determination was ratified by the population surveyed with an affirmative tendency, thus having 75% of positive responses (see figure 9).
Figure 9. Population with their own bicycle and population willing to use BICI UFPS

It is determined that the BICI UFPS proposal has a high degree of acceptance. However, when inquiring about the interest in using the bike stations regardless of having their own bicycle or not, it was determined with 81% of those surveyed with a positive perspective according to the system use. Meanwhile, it was also determined which are the conditions that provide greater acceptance and use of bicycle stations: finding 46% of those surveyed needing to be located in a safe place, 21% attach more importance to being close to their places of destination (near their home), 18% consider that the previous two are indifferent and think about a possible cost of the service and, finally, they consider that the use factor is due to the environment (see figure 10).

Figure 10. Use of bicycle parking and condition factors for its use

It was determined that only 4% of those surveyed have been beneficiaries of the “En Bici a La U” project, this demonstrates the effectiveness in the coverage impact of the current demarcated system (see figure 11).
5. **Diagnosis**. UFPS has a project that leads the business administration program, the project consists of the loan of 37 bicycles to provide transportation service for students benefiting from the program from their homes to UFPS facilities and vice versa. Now, the bicycle system works as follows: The loan is agreed for the duration of the semester, where the student agrees to take care of the bicycle, give it proper use and deliver it in optimal conditions at the end of the academic period; the bicycle does not rest in the parking stations of the UFPS on a continuous basis, that is, according to the dynamics of the system, most of the time on loan rests in the homes of its beneficiaries, since the beneficiary's last destination is his residence.

For this reason, the UFPS does not have absolute governance over the object on loan, during the period agreed with the beneficiary; which can generate detriment to the goods that the UFPS acquired for this project (Bicycles), likewise in the future, there is a high probability of generating total losses of the same and possible unfeasibility in the continuity of the project. In addition, it should be noted that the system is not only the bicycles, but the set of goods and services that comprise the dynamics of the system, this integrates stations, bicycles, places or physical spaces, and work personnel that leads to the operation of the system.

So, as mentioned in the analysis of Illustration 12, these bicycles are not being used efficiently, since they are not covering a large number of beneficiaries for their use, which means that the goods acquired by the UFPS for the benefit of the entire academic community is not meeting this objective, since it focuses on a low amount of the population, although enrollment is open to the entire academic community, it does not benefit a significant percentage that justifies the expense.

Therefore, the vast majority of the floating population has its own bicycle; In this way, the current model of monitoring and traceability of these bicycles is carried out in order to ensure physical integrity, by exchanging a plastic token for the identity document that accredits you as a student, administrator or teacher of the university or by a document that identifies you as a citizen, this exchange takes place at the pedestrian entrance of the facilities and it is the user who must transfer his bicycle to the platform; It is confirmed that the platforms are not numbered according to the logical order of the cards. Therefore, the card is not a guarantee of finding a free parking space when using the station cycle, this generates situations as shown below (see figure 12).
In addition to this, the stations do not have a strategic location and an independent entrance, that is, the entrance for people with reduced mobility is shared, in other words, it ends up being used to a greater extent by bicycle entrance, since it is being used this entrance (it has a ramp), by bicycle users. So, the signs are not respected and the fact that it is a priority entrance and for the exclusive use of people with reduced mobility is not respected either.

**Conclusions**

The floating population shows a high degree of acceptance of the constant use of bicycles as an alternative means of transport, this is how a 20% bicycle usability index is evidenced as a means of transport to go to the Francisco de Paula Santander University (headquarters major). Additionally, it is evident that 81% of the population is willing to use the bicycle as a means of transport, for which the project presents a prospective feasibility with a solid base due to the demand for the service, since only 32% of the population of bicycle users have their own bicycle, in addition to the fact that the same 81% are willing to use the UFPS public bicycle system.

Although the current system of public bicycles of the alma mater -En Bici a la U- is a significant precedent for the promotion of this type of environmental alternatives in transportation in the city of Cúcuta, it does not have full governance over the material goods of the UFPS (the bicycles) since these are delivered directly to a single person and it is this person who uses it without having any type of monitoring during the long loan period. Likewise, the furniture provided does not rest in the UFPS but in the homes of the beneficiaries of the program, as corroborated by the 4% of the favored population within the studied population, this supports an idea of the usability indicator of the 37 bicycles that the system has available.

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