

Scientific
Journal of
**Applied
Social and
Clinical
Science**

**URBAN MOBILITY
OF STUDENTS AT
A HIGHER-LEVEL
INSTITUTION**

Gabriel Fernandes Rivabem

Technologist in Business Management by
Fatec Indaiatuba-CEETEPS, Indaiatuba-SP
<https://br.linkedin.com/in/gabriel-fernandes-rivabem-8b249624b>)

Simone Tiemi Taketa Bicalho

Prof. Dr. Of university graduation, Fatec
Indaiatuba-CEETEPS, Indaiatuba-SP
<http://lattes.cnpq.br/2853061653809684>
<https://orcid.org/0000-0001-9945-6304>)

All content in this magazine is licensed under a Creative Commons Attribution License. Attribution-Non-Commercial-Non-Derivatives 4.0 International (CC BY-NC-ND 4.0).



Abstract: Urban displacement in an accessible way for students is one of the factors that contribute to the sustainability of transport. To this end, the National Policy for Sustainable Urban Mobility has been instituted, which advocates transportation models that have less impact on the environment and people. The municipality of Indaiatuba/SP, when implementing structures to facilitate mobility, moved the Bus Terminal to the Santos Dumont Highway, which affected the way Fatec Indaiatuba students move around, and the use of mobility applications, which may have modified the way of getting around for many students in order to reduce costs and be more practical. This work aimed to raise the forms of urban mobility of the students of the technology course in business management at Fatec Indaiatuba and verify how much this represents in their monthly budget and suggest alternatives for sustainable urban mobility. The methodological route was exploratory research, with a survey together with Fatec Indaiatuba students regarding urban mobility. Most students use to get around by car, followed by the use of public transport.

Keywords: Academics. public transportation. urban mobility.

INTRODUCTION

Urban mobility has been transformed in recent times. Moving from animal traction, on foot, to individual and collective motorized vehicles. However, there have been advances through technological innovations in transport applications, shared rides, among others. Taking as an example, Uber, an application that has a function similar to that of a taxi, arrived in Brazil in 2014 bringing ease due to access to information and communication technology (ICTs) and the internet.

However, the country meets the Sustainable Development Goals - ODS, and specifically

Goal 11 - Sustainable Cities and Communities. (ODSBRASIL, 2020) This aims to have accessible and sustainable transport by 2030. For this, there is the National Urban Mobility Policy aimed at sustainability. (BRASIL, 2012)

This facility has replaced some other means of transportation that already exist, such as buses, cars and motorcycles.

In this same context, a large portion of the benefited population are college students, who have easy access to more accessible transport for specific times, and with comfort. But there are still those who use public transport because it is more economically accessible depending on the distance travelled. Soon, Fatec Indaiatuba students had a change in locomotion, with the change of the Bus Terminal in Indaiatuba/SP. Because they started to take another bus to get to the new Terminal, some chose to walk to the bus station and others left the class earlier to be able to catch the bus on time.

This way, this work has as guiding questions: What are the main forms of transportation for students of Business Management at Fatec Indaiatuba to be able to attend college? What are the viable alternatives for this mobility to be sustainable and are urban mobility applications used?

Since the objective of this work is to raise the forms of urban mobility of the students of the technology course in business management at Fatec Indaiatuba and to verify alternatives for sustainable urban mobility and to raise how many use mobility applications.

The methodological path of the work is an exploratory research with a bibliographical review on the theme of urban mobility. The data were collected through the application of a questionnaire in google forms, with closed and open questions to the students of the Technology Course in Business Management at the Faculty of Technology Dr. Archimedes Lammoglia (Fatec Indaiatuba). The collected data were tabulated and analyzed qualitatively

and quantitatively.

THEORETICAL BACKGROUND

URBAN MOBILITY

According to (FÉLIX, 2015, p. 12) urban mobility can be seen conceptually, nothing more than the displacement carried out by people in the most varied activities, such as leisure, study and work. If we go back in time, we will see that urban mobility has evolved year after year until the present day, according to (RUBIM, 2013) in the past, public, private and cargo transport was carried out by animals, this happened in Brazil and also in several other countries. The author shares that:

Preference to road transport began to be given from the 1934 Constitution, with the direction of efforts to build highways in the country. In 1956, the automobile industry was introduced, followed since then by public policies to support motor vehicles, especially cars and motorcycles.

According to Vasconcellos (2011) there was a great change in urban mobility in the 1960s, as people began to use more and more automotive vehicles such as cars, motorcycles and also buses, leaving aside vehicles that used electricity such as trams and trains. According to research carried out by him in 2007, in urban areas with more than 60,000 inhabitants, there are around 150 million trips, with 35% of this amount being on foot, 32% using public transport and the rest with cars and motorcycles.

With this, it is understood that motorized vehicles and some non-motorized vehicles have become the choice of people to come and go every day, however, according to (RUBIM, 2013) with this change and increase in the number of motor vehicles, over the years has been generating some environmental and sustainable problems due to excessive use. It also states (CARDOSO, TRANSPORTES, v.

XVI, n. 1, p. 25, 2008) that these problems faced, such as the impact on traffic flow, polluting gas emissions and a lot of noise are reaching medium and large cities. There is a problem that is easily seen in almost all of these cities and that also generates this impact, residential and service areas have been moving to the peripheral areas of the cities and becoming distant from the central areas of the cities, making the displacement greater according to (CARDOSO, 2008, p.25). Another major problem caused by the excess of vehicles is traffic accidents, with about 20 deaths per 100,000 people.

As a result, the National Urban Mobility Policy (PNMU) contains some objectives for better urban mobility, such as improving urban conditions (PORTALFEDERATIVO, 2012). Among the ways for people to move around, we can mention cars, motorcycles and buses as motorized means, as non-motorized means we have bicycles, on foot, among others.

SUSTAINABLE URBAN MOBILITY

The term sustainable means conserving and caring. With this sense of understanding, sustainable urban mobility can be defined as the concern for conservation and care that are necessary to preserve it.

In this context, some projects and measures are created for more sustainable urban mobility, aiming at reducing pollutant emissions, traffic problems and creating an opportunity for people to exercise. Among these measures and projects, the first focus is on the displacement of people using non-motorized means, such as bicycles, through which, according to BRASIL (2012, p.19), some areas and times of cities have received access restrictions for motor vehicles in order to use of these spaces for cyclists and pedestrians and in a very well signposted way to be safe, in addition to that several locations in the cities gained exclusive lanes

for pedestrians and cyclists.

Another project in force is the definition of exclusive lanes for public transport and also for non-motorized means, a bus holds many people, thus generating an opportunity to use it without having to use their private vehicles, thus favoring the use of the urban space and guaranteeing fluidity in traffic and with less pollution of the environment. Just as every expansion has its costs, the expansion and maintenance of roads used by cars are of high value, however, according to (PORTALFEDERATIVO.GOV.BR, 2012, p.19) one way to minimize inequality is to charge urban tolls, thus redistributing in the form of improvements aimed at sustainability in urban mobility.

Still looking at sustainable urban mobility, according to (PORTALFEDERATIVO.GOV.BR, 2012) the control, management and implementation of existing and new free parking lots would be a good way to generate sustainability and economy, since these parking lots are located close to medium and large capacity public transport terminals, people would stop using their private vehicles to cover most of the journey and would use public transport, avoiding causing more congestion and ceasing to emit a large amount of polluting gases.

In addition to means and strategies being designed and implemented to reduce the use of private vehicles, according to ((PORTALFEDERATIVO, 2012) there are standards that can be implemented and are directed towards the transport of cargo, currently the circulation of cargo is very large, for this reason, circulation planning must be integrated with Urban Mobility Systems, this way, the selected times and locations can be given priority or restricted, generating a better flow of vehicle traffic.

Through all these possibilities that generate benefits to our society, it is mentioned by (UN,

2015) that:

By 2030, provide access to safe, accessible, sustainable and affordable transport systems for all, improving road safety through the expansion of public transport, with special attention to the needs of vulnerable people, women, children, people with disabilities and the elderly.

This way, we can understand that planning and improvement is already something planned by a large body.

As society and technology evolve, innovations began to emerge in this area of urban mobility. In mid-2010, the first applications aimed at urban mobility began to emerge, bringing great ease and innovation to an even more sustainable urban mobility.

MOBILITY APPLICATIONS

As it was well seen in the course of this work, the plans and projects for the improvement of urban mobility have been taking place for several years, however, in the years 2010 and 2011 something new emerged giving an even greater impetus to this development, and they were the applications for cell phones aimed at people displacement services.

According to (MARIANO, 2017) the first big company that emerged and created reach practically all over the world was Uber, this startup company was founded in 2009 in the USA and brought the revolution and a new meaning in the concept of transport services. Uber introduced an application technology model to the market and made it available for use through smartphones, with its function being to create an intermediary through the application between customers who want to use the service and autonomous providers.

This way, both register on the platform for the respective use, customer or provider, after this process the customer selects the starting point and the point where he wants to go, after which the amount that will be charged for this

displacement is shown. As soon as the service is requested, the providers that are closest to the starting point receive a request and may or may not accept the route desired by the customer.

A very important point now occurs, after the provider agrees to perform the service, the customer receives all the necessary information from the provider and the car for better identification and security. This application gained a great deal of space in the market for providing greater convenience, security and profitability for its customers through this business model and technology, as well as the way services are performed.

Over the years, improvements in the application's functions and settings have been developed, as well as adjustments have taken place through the laws of countries, such as Brazil, this way, this model has become a new means of safe, comfortable and comfortable travel. profitable for people and showing a much higher viability than using your own private car to come and go.

However, according to (MARIANO, 2017) with the innovations and developments of technology in the world, it did not take long for new competitors to emerge in the same market, such as 99 POP, Cabify, BlaBlaCar, among others, all of them with similar functions and some differentials providing the power of choice for the company's customers that best meet their needs and at the best prices. Unlike other modes of transport, this model used by these various companies also allows customers to use services at any time and be encouraged with discounts to use more and more, but they are not the only beneficiaries, service providers as well they are rewarded with cash bonuses and slightly higher charges for working unusual hours.

In this same context, competitors were diversifying and among different applications for urban mobility, one of them came up

with a vision beyond what concerns safety for women, it was the company Lady Driver, an application created with the same functionalities and objectives as the others, however, only serving the female public, whether as a customer or service provider, the service occurs only among women, making the trip safer and more comfortable for them without the possibility of an uncomfortable situation occurring with men (LADY DRIVER, 2019).

Even with innovations arriving more and more, applications like the ones seen above with their differentials and even for a specific type of customer, not the entire population takes advantage of it and accepts it easily, there is an adaptation phase for people to start accepting these new technology models.

Transport by application is one of the ways to move around in large cities in a practical and economically accessible way for many students. We have: Uber; 99; Blablacar; Buser; Moobie.

PEOPLE'S ACCEPTANCE OF MOBILITY APPS

Technology has been developing and evolving for many years, in view of this, all the novelties that have emerged for the population have undergone an acceptance process, it being obvious that the more benefits this technology generated for people, the more easily acceptance occurred. According to Mariano (2017) the study of this acceptance of technology has occurred since the last century and has always been the subject of interest of researchers.

Faced with these new advances in technology aimed at urban mobility, such as the applications mentioned in this work, after the arrival of this technological novelty in 2010 and being easily accessible by practically the entire population of the country, even so, there was a process of acceptance and

adaptation of people.

A study carried out in the city of São Paulo with an audience of almost 100 people, 37.80% use this mode of transport for leisure purposes, and the remaining percentage is divided into weekly use for work, use for adverse situations and to go study. (KUWAHARA, 2019, p. 12)

The research also pointed out an important factor that helps in the easy acceptance of these applications, public transport in most medium and large cities cannot have the full range of all areas, creating a gap where this new mode of transport currently fits, generating feasibility for people, according to (KUWAHARA et al., 2019, p. 12), 63.75% of the people who participated in the survey use intermodality with public transport and travel apps to reach their destinations.

It is a fact that in the past, when a person would like to go to their destination and was unable to have their own car, they had some options, such as: going on foot, by bus or by taxi. However, according to Kuwahara et al. (2019) private transport works were only carried out by private taxi companies that charged high and unfeasible values for most families, given this scenario, with the arrival of applications generating feasibility and accessibility for the majority of the population, an alternative was found resulting in a rapid acceptance of the modality.

Just as there is a process of acceptance and adaptation with all new technology and innovation that arises aimed at the use of the population, with transport applications it also happened, there was a time of acceptance and understanding of the safety and feasibility of the new means of displacement, however, with a much faster format because it is linked to something that people do on a daily basis. According to Kuwahara (2019), the age group of people using the applications is 21 to 30 years old, so it is clear that the portion of people aged 30 years and over are still

adapting and accepting or not using this new technology in their lives..

After a broad contextualization and reasoning about urban mobility and the other items seen throughout this work, analyzing the whole of the country, we will go into a deeper analysis of urban mobility in the city of Indaiatuba.

URBAN MOBILITY IN INDAIATUBA

The city of Indaiatuba has been evolving and growing more and more, new areas of the city are used and affected by the expansion that occurs year after year, as well as the population growth and which is currently around 250,000 inhabitants, and consequently the number of displacements and distances traveled by people also increase.

According to the PDMUS - Indaiatuba (2016), research and analysis carried out resulted in the number of 350,190 trips that are made every day by the inhabitants, divided into the use of buses, with 54,809 trips per day, 105,348 by non-motorized transport, 189,497 by car and individual motorcycles, taxi and 535 in other ways. Table 1 and 2 of the more detailed divisions follow.

Given these numbers, we can see that urban mobility in Indaiatuba is much more intense than in recent years, according to (PDMUS - Indaiatuba, 2016) even though the city is not so big compared to Campinas, it is also necessary for the existence of planning and adjustments so that traffic and gas pollution problems are minimized, as well as so that people can have more viability and economy in their displacements, thus introducing a more sustainable mobility. According to (PDMUS - Indaiatuba, 2016) with the increase in vehicle traffic in the city, a better management of the places of peaks and higher problems began, some points of the city began to receive improvements such as: better signs, traffic lights, reconfigurations of the road spaces,

TRANSPORT MODE	TRIPS PER DAY
Bus	54.809
Non-Motorized Transport	105.348
Individual (car and motorcycle)	189.497
Others	535
Total	350.190

Table 1: Mode of transport and number of trips per day in Indaiatuba/SP

Source: PDMUS, 2016.

NON-MOTORIZED TRANSPORT	NUMBER OF TRIPS PER DAY
On foot	89.290
Bicycle	16.059
Total	105.348
INDIVIDUAL TRANSPORT	
Self + Taxi	153.607
Motorcycles	35.890
Total	189.497
OTHERS	
Truck/others	535
GRAND TOTAL	350.190

Table 2: Type of transport Non-motorized, individual and others; and number of trips per day in Indaiatuba/SP.

Source: PDMUS,2016.

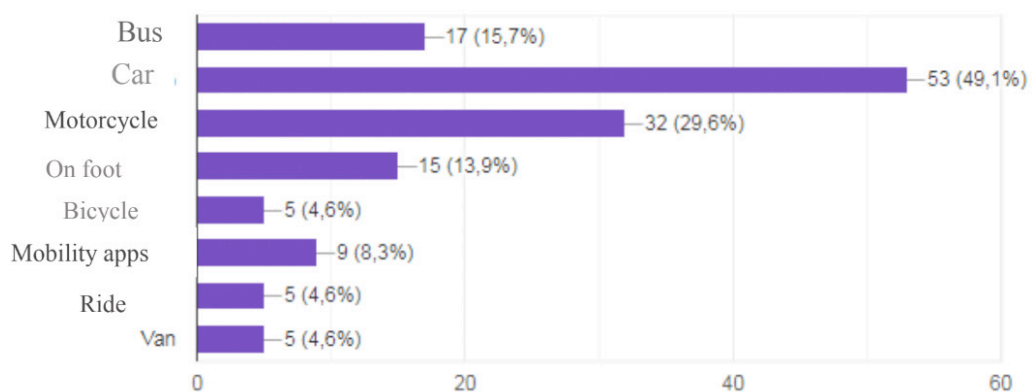


Figure 1: Answer to Question 1: “In the period before the pandemic, how was your mobility to and from college?”

Source: Own elaboration, 2021.

attempts to encourage people to circulate on foot in commercial areas, adaptations of parking lots on public roads, among other changes made with a view to making better use of the capacity for people to circulate.

Thinking about the planning of sustainable urban mobility for the city of Indaiatuba and along with the implementations that the city has received over the years, according to (PDMUS - Indaiatuba, 2016) an initiative for a new bus terminal began, since then this terminal came to be built in a new location in the city, with much better support and convenience for people, new lines and with easy access to buses from other cities, thus generating greater viability and seeking to provide people with a more sustainable and economical way of moving around the city without the need to use your personal car. According to (PDMUS - Indaiatuba, 2016) another planning and project carried out for the city of Indaiatuba, focusing on sustainable, economic and viable mobility for the inhabitants, went to bicycle lanes and lanes throughout the city, in addition, four points for public loan of bicycles made with reusable materials, called EcoBikes. There are just over 22 km of very well thought out and introduced bike lanes and lanes that extend throughout the city, the action front on this project taken by the city according to (PDMUS - Indaiatuba, 2016) is to adapt and expand the existing and new ones that will emerge aiming at a low slope to be possible for everyone to use and maintain the important safety factor, in addition to having a continuous focus on sustainable mobility, it also stimulates and provides an improvement in the health of the inhabitants. Within the planning of cycle paths and cycle lanes, there is the capacity to service commuting trips (home-work, home-school and home-university), short distance trips, intermodal trips (home-bus terminal) and also for the use of physical practices.

As seen previously in this work, the new transport also had great acceptance in the city of Indaiatuba, people began to choose more and more to use these applications to move around, however with the improvements made in the city and which were mentioned above, inhabitants are free to choose more than one sustainable means of getting around.

Because Indaiatuba is close to the Viracopos airport and is located close to other cities such as Itu, Salto, Sorocaba, Monte Mor and Campinas, this provided a large volume of trips for the application service providers as they have services available to be carried out both inside and outside the city, thereby encouraging more and more people not to use their own vehicles. Through these improvements in means of transport and the innovation of applications generating a new modality, this caused a change in the lives and displacements of students to colleges.

In the municipality of Indaiatuba there are three faculties, which are Fatec Indaiatuba, every day hundreds of students make trips to and from work or their homes to these two faculties. With the innovation of applications, some changes were provided to them, for example: the division of a trip into two or more people when leaving, thus proving to be in some situations more viable and economical than using the individual car, the same situation can be applied to public transport improvements. Within this context, the urban mobility of Fatec students in Indaiatuba is the research and analysis objective of this work.

DEVELOPMENT OF THE THEME

The research characterization used in this work is exploratory, according to (GIL, 2002) its objective is to generate a greater familiarity between the researcher and the studied problem, thus providing a better proximity between the universe of the problem and it, being able to obtain more relevant information

for the formulation of hypotheses. According to (GIL, 2002) through it is possible to better understand the important phenomena related to the problem and that sometimes other researchers do not accept easily, in addition, it allows the choice of the most appropriate methods for carrying out the research and thus making decisions about the points of issues that need greater focus in the midst of the development of the research. The methods used in this research according to (GIL, 2002) are: data collection, interviews with people who have some kind of involvement with the problem and who have some knowledge about it and field research.

Data collection took place at Fatec de Indaiatuba, located at Rua Dom Pedro I, number 65, Cidade Nova, with students from the 1st. To the 6th semester of the Technology Course in Business Management, through the application of a questionnaire, where they will be asked about the forms of transport used by them, about the impact of changing the Indaiatuba bus station, as there are some who live in other municipalities, as well as, find out how much of the monthly budget is used to travel to Fatec Indaiatuba. The data collected by the questionnaire will be tabulated, graphs and tables will be generated with the data for analysis. This way, understanding and obtaining all the impacting phenomena on urban mobility referred to them in coming and going to college. With this developing even more structured hypothesis.

RESULTS AND DISCUSSION

URBAN MOBILITY OF STUDENTS OF THE TECHNOLOGY IN BUSINESS MANAGEMENT COURSE

Through the collection of data from this work, a form of questions directed to all students of the Technology in Business Management Course was developed with the objective of collecting the largest possible

quantity of answers and being them of quality. In this form we had 108 responses, and it will be analyzed in this work in a general way at the first moment, after that another more detailed and in-depth analysis will be carried out among the different semesters and shifts.

Below we begin the analysis of the issues in general as mentioned before.

In the first Question, out of a total of 108 responses, 49.1% of people used cars to get to and from college before the pandemic. 29.6% used motorcycles, 15.7% used buses to come and go, 13.9% walked, 8.3% used mobility apps, 4.6% used bicycles, 4.6% enjoyed rides and 4.6% paid for a van for transportation. (Figure 1)

Question 2: “What was the weekly frequency that you used these means?”

In this Question, we observed that most people used their means of locomotion practically during the five days of class, some people used the mobility apps once a week or on rainy days and others interspersed their means of locomotion during the week, on some days of the week they used the car or motorbike and on other days they went for a walk.

Question 3: “After the option selected above, describe the reasons that led you to use that particular medium.”

In this Question, the idea was to identify the reasons that the students had to use those certain means of locomotion that they pointed out in the first Question. There was a large number of responses, however most people used one of those certain means due to its ease of access, others used it for practicality, agility, necessity, other people had sustainability and financial savings in mind. However, some people unfortunately did not have as many options to choose from due to their financial situation and the precariousness of public transport routes around the city.

Question 4: “What is the degree of

satisfaction where 1 is dissatisfied and 10 is very satisfied with regard to the comfort, convenience, running time and cost of the selected option that you used to go to and from college before the pandemic?”

This Question aimed to analyze whether or not students were really satisfied with the means of transportation they used before the pandemic, 32.4% of students gave a score of eight, 28.7% gave a score of ten, 14.8% gave score seven, 13% gave a score of nine and 11.1% gave a score of six and below. After analyzing the graph, we see that 88.9% of the students who answered the form were satisfied with the means they used to get to and from college.

Question 5: “How did you commute daily before the pandemic to work and other activities and how is it currently?”

The purpose of this Question was to analyze whether or not there was a big change in the means used for locomotion due to the pandemic. In view of the responses analyzed, most people continue to use the same means of locomotion that they already used before the pandemic, such as cars, motorcycles, public and private buses, bicycles, apps, some take walks and a part of these students intersperses between means. Meanwhile, the pandemic has affected some, making it almost unnecessary to leave the house, with this rarely using their own means of driving.

Question 6: “In the period before the pandemic, did you use your own or borrowed transport and which do you consider better for mobility?”

In this Question, 95% of the answers were for driving themselves for practically the same reasons, namely convenience, comfort, practicality, safety and trust. Some students in their answers commented that with borrowed driving there is the possibility of an accident occurring causing damage to both parties or delay in some way to use the borrowed

driving. The small percentage of students who will opt for borrowing is due to the fact that they use the family’s means of transportation.

Question 7 aimed to understand and raise information on expenses and expenses that students had for college and home before the pandemic. (Figure 2)

Through figure 2, it was possible to identify that: 27.8% of the 108 students spent around R\$50 reais, 22.2% spent between R\$50 and R\$100 reais, 30.6% spent between R\$100 and R\$ 200 reais, 13% had expenses between R\$200 and R\$300 reais and the remaining 6.5% ended up spending R\$300 reais and more.

Answers to **Question 8:** “In the period before the pandemic, did you share with other people the means of transport you used to go to and from college? (For those who only used cars, motorcycles and mobility apps)”

Through figure 5, it was possible to identify that 86.1% of the 108 students who answered the form did not share with other people the means of transport they used to go to and from college, including cars, motorcycles and apps. Only 13.9% of students shared one of these three environments with other students.

Identified that 93.5% responded that they had no personal cost for sharing transport, while 6.5% did.

Question 10 aimed to identify whether the 108 students used the apps both for commuting to and from college and also for commuting to other places.

At Question asking: “In the period before the pandemic, did you use mobility apps to get to and from college or to other places?” The responses by were that 54.6% used the apps as a means of transportation in the past and 45.4% did not use them.

Among the applications most used by students who answered the form, 71.3% use Uber, 6.5% use 99, 0.9% Yellow and the remaining 21.3% use other applications or do

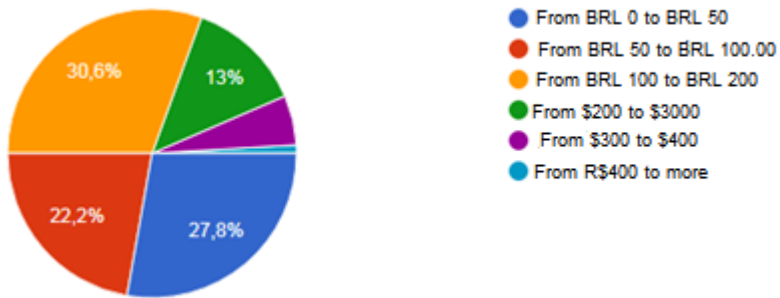


Figure 21: Answers to Question 7: “What monthly expenses did you have to go to and from college before the pandemic?”.

Source: Own elaboration.

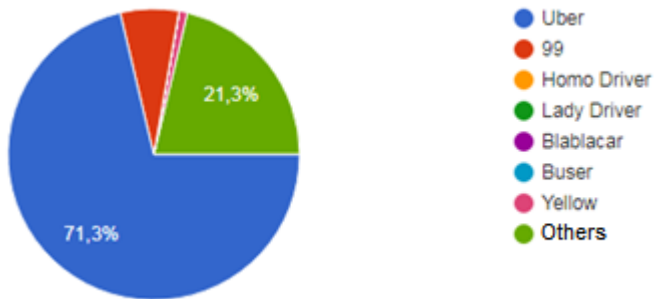


Figure 3: Answers to Question 11: “Which of these urban mobility apps below did you use before the pandemic and today?”.

Source: Own elaboration.

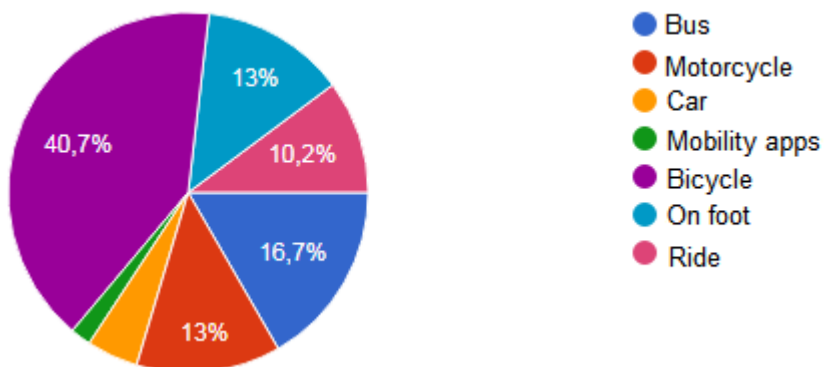


Figure 4: Answers to question 13: “In your opinion, what was the best sustainable and most viable way to get to and from college in the period before the pandemic?”.

Source: Own elaboration.

not use any. (Figure 3)

Question 12: “What is your opinion about urban mobility applications?”

The question was developed with the aim of collecting different opinions about a type of locomotion that is also different and innovative and that today is part of most people. Through the responses collected, some students have never used it and therefore have no opinion about it, others use it sometimes or frequently and punctual positive and negative points. These being the positive points: practicality, affordable price at a certain time, the ease and comfort generated for quick locomotion, convenience and a great option for those who do not have their own transport. The negative points scored are: some of the women feel afraid to use the applications because they are afraid, other students say that for daily use it has a slightly high cost and lack of security for always being an unknown driver and using it in late hours.

Among students, 40.7% believe that the bicycle is the most sustainable and viable way before the pandemic, 16.7% believe that it is the bus, 13% believe that it is the motorcycle, 13% believe that it is on foot, 10.2 % believe that hitchhiking is best, 4.6% believe that it is cars and 1.9% believe that it is urban mobility applications. (Figure 4)

As for the question, “leave your opinion below about the means of mobility made available by our city hall, such as buses and bike paths and what improvements you think must be made”.

With this question open to the students’ opinion, this work wants to understand what vision they have about the public means of transportation offered by Indaiatuba, such as buses and bicycle paths. Some of the students had never used either of the two means and therefore did not give an opinion. Those who have already made use of it point to it as a very large quality differential in the city, but

that improvements need to be made in both environments.

In the case of cycle paths, they point out that they are of great quality, but implementation in other areas of the city is necessary, as well as improvement in signaling and awareness of the population.

Regarding the buses, the students point out that structural improvements have already taken place in the buses, however some more are needed, such as the preparation of the drivers, reduction of the ticket value, increase of the lines around the city, allowing the student to also take a bus to leaving at night after studying, reduced travel time and improved route planning.

Of the 108 students who answered the form, 3.7% are from the 1st semester, 13.9% are from the 2nd semester, 19.4% are from the 3rd semester, 12% are from the 4th semester, 16.7% are from the 5th semester and 34.3% are from the 6th semester. Of the respondents, 55.6% of the students who responded study at night and 42.6% study in the afternoon.

Since 70.4% of the students who responded are male, 28.7% are female and 0.9% is not declared.

Among the respondents, 34.3% of the students who responded are between 17 and 22 years old, 25% are between 23 and 28 years old, 25% are between 29 and 34 years old, 11.1% are between 35 and 40 years old and 4, 6% are aged 41 and over.

Regarding salary range, 28.7% earn between R\$0 and R\$1,000, 32.4% are in the range between R\$1,000 and R\$2,000, 24.1% are between R\$2,000 and R\$3,000 and finally 14.8% has its salary range of R\$3,000 or more.

Among the total responses, 55.6% of the students are single, 40.7% are married, 1.9% are divorced and 1.9% are in another marital status. 75% have their own income and 22% do not.

Among students, 75% have their own

income and 25% do not.

The survey identified that 72.2% of students had jobs before the pandemic and 27.8% were not. Of the respondents, 69.4% responded that they remain employed even with the pandemic and 30.6% either lost or remain without a job. The income power of the students' families was surveyed, and 25.9% of them have a family income of 1 to 3 minimum wages, 44.4% have an income of 2 to 5 minimum wages and 29.6% have an income 5 minimum wages and more.

DATA DISCUSSION

Based on the responses obtained in the survey among the students, it was possible to notice that even though among the means used by him before the pandemic to get to and from college were cars, with 49.1% of the responses, followed by motorcycles with 29.6%, buses with 15.7%, walking with 13.9% and mobility apps being used by only 8.3%.

As grounded in Chapter I of this work, the city of Indaiatuba implemented sustainable means of locomotion for people, such as cycle paths and some of the best ones ever made with buses. However, in these two means of transportation there are many flaws and important points to improve to become really great sustainable means that can be enjoyed by Fatec students. As viable and, at the same time, more sustainable means of transporting students to college, buses, bicycles and mobility on foot fit together very well, buses provide the transport of a larger number of people to the same location, since cycling and walking do not emit pollutants into the air and also help a lot to maintain a healthy life and exercise. However, in one of the open responses on the form, it was possible to notice the dissatisfaction that most students have with the bus lines, because especially at night there are not so many buses and they pass through all the neighborhoods

making it difficult to get around. As for bike paths, students point out that it is very well developed around the Ecological Park, but in other neighborhoods of the city, such as the center, there are no bike paths anymore and many people are afraid to walk for fear of assaults and robberies. These three means of mobility are considered extremely sustainable and receiving greater attention for investments would provide mutual improvements.

Kuwahara et al (2019) conducted a study with students from Fatec de São Paulo on transport by apps in the city of SP. The study had 181 responses, 75.7% of the people who responded use mobility applications occasionally, this research being compared with the research carried out in this work, it is possible to observe that the percentages are very similar, because, among the 108 students who answered the questionnaire, only 54.6% used the apps to move to places other than college, thus understanding that they used them occasionally as well.

In contrast to the pandemic, according to (LOBO, 2020) a survey was carried out at the end of July by company 99 in some neighborhoods of the city of São Paulo, a percentage of 54% was obtained referring to users from the peripheries who increased their use with transport by apps, the biggest reason among them was to avoid agglomeration in public transport, minimizing the risks of contamination. According to the author, another curious point pointed out by the survey is the fact that there was a 42% drop in the number of app users who have greater purchasing power between February and August, for (LOBO, 2020) this can be understood by the possibility of these people having easy availability to join the Home Office. This way, the perception of how mobility applications had great importance and efficiency in some scenarios of society is clear, and in others they ended up not having

any.

Among the research carried out in this work regarding urban mobility applications, there was a great surprise due to the low volume of people who used them to go to and from college. Of 108 students, only nine actually used the apps to get to and from Fatec even if they alternately used other means as well, however, when you think of more financially and sustainably viable means for students, it was expected that the apps would receive a closer look. bigger because they don't have a high cost and because they provide the possibility of sharing among more people.

Considering the nine students who also used the apps to get to college in addition to other means, it is possible to identify that both of these people have the following characteristics in common: they are all women, have an average family income of 2 to 5 minimum wages minimum, all used Uber among the applications, used the application from 2 to 4 times a week, had expenses with transport to go to the Faculty corresponding to 20% of their budgets, the reasons why they used the application were related to difficulties with bus lines, rainy days or when they had no other means available, their satisfaction rate ranges from 6 to 10 regarding the means of mobility used and currently only two continue to use the application. Among the nine, four study at night and five in the afternoon, one is from the 2nd semester, three are from the 3rd semester, one is from the 4th semester and four are from the 6th semester.

As already mentioned above, the data collected indicate that the car was the most used means of transportation among the 108 students who answered the form. Of these 108 students, 53, most of whom were female, responded that before the pandemic they used cars and some other means to get around on that college route. The frequency of car use by these 53 students is on average 3 to 6 days a

week. The reasons most cited by these students for using cars are related to the following things they provide: comfort during the journey, practicality to come and go, agility to get to college quickly, comfort in locomotion, for those who live at greater distances it is more effective, time-saving when needed and chosen, as public transport in the city is a bit precarious with respect to available lines at late hours. Through an analysis of the answers given by these students, it is understood that they had expenses with transport to go to the Faculty corresponding to 5% to 10% of their budgets, there were students from all semesters who answered the questionnaire, however most are currently in the 6th semester.

Through the form applied to the students, it was also possible to identify, through two questions, how the majority are currently in relation to jobs. From the information passed on by television programs, it is possible to see that there was a percentage of people who ended up unfortunately becoming unemployed due to the effect of the pandemic. Among the students who answered the questionnaire, about 4% of them were employed before the pandemic, however, after its arrival, they ended up losing their jobs, but from the amount of responses obtained, we can see that it was a small percentage close to what was expected in the face of the situation. This demonstrates that companies are really adapting to the situation in order to remain alive in the market and with their employees. Through the average expenses of the students, the applied form also provides an analysis of the data, making it possible to reach an average percentage of these expenses that everyone had to travel to college every day. Most students had monthly expenses between R\$50.00 and R\$200.00 and an average salary between R\$500.00 and R\$2,000.00, among these data it becomes understandable that they had a percentage of expenses with transport

between 10% and 20% of their budgets to go to College.

FINAL CONSIDERATIONS

The present work can identify the main means of transportation for students of the Technology Course in Business Management at Fatec Indaiatuba to get to college. It was believed that it could be urban mobility applications.

This way, the following guiding questions can be answered: What are the main forms of transport and/or locomotion that Fatec Indaiatuba Business Management students use to attend college? What are the viable alternatives for this mobility to be sustainable and how many use urban mobility applications? Therefore, its objective is to raise the forms of urban mobility of the students of the technology course in business management at Fatec Indaiatuba and to verify alternatives for sustainable urban mobility and to understand how many use mobility applications.

With the answers obtained, the work answered the problem pointed out, we understand what are the means of locomotion used by students before the pandemic to move to and from college, which are the most used and why they are used. It was expected that sustainable means and urban mobility applications would have higher percentages, however, through the applied questionnaire, we understand that both sustainable means and applications added together do not include even 30% of the 108 students.

The main results obtained and analyzed in this work were the means most used by students before the pandemic, such as cars (49.1%) and motorcycles (29.6%), the reasons given for the use of those particular means of locomotion, the low percentage (8.3%) of students who used the apps, the opinions obtained about them, the low percentage

(4%) of students who lost their jobs with the arrival of the pandemic, opinions about more sustainable means such as walking, bicycles and buses and the analysis of students' expenses for their transportation to Fatec, being a percentage between 10% and 20% of their budgets.

This way, the pandemic allowed an economy from urban mobility to reach college, enabling its use for other purposes. Thus, contributing to economic sustainability, as some students responded that they lost their jobs during the pandemic. The fact of having a reduction in the number of vehicles circulating to and from college, allowed an improvement in air quality, as the emission of Greenhouse Effect Gases (GHG) was stopped, contributing positively to minimize the effects on climate change.

With a view to the future, after an improvement in the current pandemic situation, face-to-face classes will return. It will be possible to carry out work and planning with students with the aim of devising more sustainable and viable means of transportation to college. Requests can be developed for our city hall, aiming at improvements in bus lines for students and the implementation of more cycle paths in the city, in addition to lectures on means of mobility, encouraging students to be more concerned with the subject.

REFERENCES

- BRASIL, 2012. **Política Nacional de Mobilidade Urbana** – Lei núm. 12.587/ 2012. Disponível em: < http://www.planalto.gov.br/ccivil_03/_Ato2011-2014/2012/Lei/L12587.htm> Acesso em: 15 mai. 2020.
- BRASIL,2020. **PORTALFEDERATIVO.GOV.BR**. Política Nacional de Mobilidade Urbana. 2012. Disponível em: <<http://www.portalfederativo.gov.br/noticias/destaques/municipios-devem-implantar-planos-locais-de-mobilidade-urbana/CartilhaLei12587site.pdf>> Acesso em: 20 mar. 2020.
- CARDOSO, Renata, **A percepção do especialista sobre o tema mobilidade urbana**. v. XVI, n. 1, 2008. Disponível em: <<https://revistatransportes.org.br/anpet/article/view/13/10>>. Acesso em: 23 mar. 2020.
- FÉLIX, Victor. 2015. Disponível em: <<https://pantheon.ufrj.br/bitstream/11422/735/3/VFStefanelli.pdf>>. Acesso em: 02 abr. 2020.
- GIL, Antônio Carlos. **Como classificar as pesquisas**, 2002. Disponível em: <<http://www.madani.adv.br/aula/Frederico/GIL.pdf>>. Acesso em: 02 abr. 2020.
- KUWAHARA, A.P, et al. **O impacto do transporte por aplicativo**. 2019. Disponível em: <<https://fateclog.com.br/anais/2019/O%20IMPACTO%20DO%20TRANSPORTE%20POR%20APLICATIVO%20NA%20MOBILIDADE%20URBANA%20EM%20S%20C3%83O%20PAULO%20UMA%20PESQUISA%20DE%20OPINI%20C3%83O%20NA%20PERSPECTIVA%20DO%20CLIENTE.pdf>>. Acesso em: 25 abr. 2020.
- LADY DRIVER,2019. Disponível em: <<https://ladydriver.com.br/#/inicio>>Acesso em: 26 de abril, 2020.
- LOBO, Renato. **54% dos Usuários das Periferias de SP Aumentaram o Uso de Transporte por APP**. 2020. Disponível em: <<https://viatrolebus.com.br/2020/09/54-dos-usuarios-das-periferias-de-sao-paulo-aumentaram-o-uso-de-transporte-por-app/>>. Acesso em: 05 de novembro, 2020.
- MARIANO, Ari Melo, **A importância da aceitação e uso da tecnologia em aplicativos de mobilidade urbana**. 2017. Disponível em: <https://www.researchgate.net/profile/Ari_Mariano/publication/321035342_A_importancia_da_aceitacao_e_uso_da_tecnologia_em_aplicativos_de_mobilidade_urbana_contribuicoes_da_literatura_cientifica_links/5a09c17945851545eb594b00/A-importancia-da-aceitacao-e-uso-da-tecnologia-em-aplicativos-de-mobilidade-urbana-contribuicoes-da-literatura-cientifica.pdf>. Acesso em: 03 mai. 2020.
- ODSBRASIL, 2020. **Objetivo 11** - Cidades e Comunidades Sustentáveis Disponível em: <<https://odsbrasil.gov.br/objetivo/objetivo?n=11>> Acesso em: 13 abr. 2020.
- ONU, BRASIL, nacoesnidas.org/pos2015/ods11. Disponível em: <<https://nacoesunidas.org/pos2015/ods11/>>. Acesso em: 10 mai. 2020.
- PDMUS, **Plano Diretor de Mobilidade Urbana Sustentável de Indaiatuba** – Indaiatuba, 2016. Disponível em: <[file:///C:/Users/Rita/Downloads/rt02-pdmus--indaiatuba-produto-2-v3-%20\(1\).pdf](file:///C:/Users/Rita/Downloads/rt02-pdmus--indaiatuba-produto-2-v3-%20(1).pdf)>. Acesso em: 12 mai. 2020.
- RUBIM, Barbara, **O plano de mobilidade urbana e o futuro das cidades**. Estud. av. vol.27, no.79, São Paulo, 2013. Disponível em: <https://www.scielo.br/scielo.php?pid=S0103-40142013000300005&script=sci_arttext>. Acesso em: 10 mai. 2020.
- VASCONCELLOS, Eduardo Alcântara de. **Transporte e mobilidade urbana**. CEPAL – IPEA, 2011. Disponível em: <https://www.ipea.gov.br/portal/images/stories/PDFs/TDs_Ipea_Cepal/tdcepal_034.pdf>. Acesso em: 19 mai. 2020.