Chapter

# Impact of COVID-19 on Users' Social Perception of Public Transport in Madrid

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## Abstract

The aim of this present study is to analyze how the health crisis caused by pandemic has impacted on public transport users' social perception, on their mobility decisions and whether the policies implemented have generated a greater safety for them. In order to achieve the objective, 1159 public transport users have been surveyed in Madrid. For the methodology, Bitner's Servicescape Model has been used, because through this model, it is possible to analyze the physical environment in which a service is provided. This directly affects the assessment, perception, and user's satisfaction, since the service is produced and consumed simultaneously. To complete the study, a regression model has been carried out. This study is an important contribution to academic literature, as it is the first to examine how the health crisis caused by COVID-19 has impacted on mobility decisions in the biggest city of Spain.

**Keywords:** COVID-19, pandemic, social perceptions, public transport users, Servicescape model

## 1. Introduction

Public transport plays an important role in people's lives, being the most ecological and healthy alternative for travel in the city [1]. It underlined the great importance of public transport especially in metropolitan cities to avoid congestion and pollution, promote trade development, competitiveness, and economic activity, as well as promoting social and territorial equity [2, 3]. Another important aspect of an efficient public transport system is the accessibility for everyone [4]. That means that not just the performance of public transportation but also its impact on other social aspects (such as employment rates, public health, and social exclusion) must be taken into account while planning the public transport facilities.

For all the above, when analyzing the public transport system, it is important to analyze how the service is perceived by the users [5, 6]. Several studies on the users' perception of public transport have concluded that service quality is one of the most important factors for users to decide whether or not to use public transport [7, 8]. Factors such as on-board cleanliness, comfort, safety, punctuality, and frequency of

service are main factors in gaining the satisfaction and loyalty of public transport users [9]. However, the current situation caused by the COVID-19 pandemic [10–12] has affected all types of services worldwide, including the public transport system [13, 14]. For fear of not infecting, many people have opted for private transport instead of public, which has changed mobility habits of the users [15, 16]. Moreover, maximum capacity of travelers in the public transport has been reduced, and national and international tourism mobility has been limited [17, 18].

The aim of this research is to analyze how the health crisis caused by COVID-19 has impacted on social perception of public transport users in Madrid, on their mobility decisions and whether the policies implemented have generated a greater safety for them. To achieve this objective, Bitner's Serviescape Model [19] has been applied to analyze social perceptions and to see the effect of COVID-19 on users. A sample of public transport users in Madrid has been used, and the study can serve as a basis for analysis in other cities around the world.

This paper contributes to the existing literature on COVID-19 impact studies in the transport sector, offering a specific view from the users, their perceptions, first impressions, feelings, and behavioral reactions to the situation manifested by the pandemic. This contributes to complete the study of the impact of COVID-19, which is being approached from different perspectives and disciplines.

## 2. Literature background

COVID-19 spread rapidly almost everywhere, affecting many countries around the world and causing a significant mortality rate [20, 21]. To prevent the spread of the virus, several countries had to declare mandatory quarantine for their populations, thus trying to reduce the number of infected people [22, 23]. Like most countries, in Spain, many companies that were able to change their face-to-face work into online work started to opt for teleworking [24], since the government's recommendation was to facilitate teleworking as much as possible. Because of this, the world of work changed completely from one day to the next [11].

In Spain, after people started working from home and companies closed, almost 19% drop in gross domestic product (GDP) in the second quarter of the year 2020 was recorded [25]. One of the sectors directly affected by the lockdown and pandemic was the public transport sector [15, 16, 26, 27]. Significant increase in teleworking, temporary or permanent loss of job, or changes in labor mobility habits are the factors that decreased significantly the use of public transport in Spain [15, 16]. Other factors also affecting the use of public transport were: the reduction of maximum capacity of travelers in the public transport, service reduction, and decrease of national or international tourist activities [17, 18]. In addition to this, many public transport users refuse to use it to avoid social contact, thus reducing the risk of infection. Therefore, it is important to evaluate the users' perception of public transport safety.

All of the above has caused Spanish public transport to experience a drastic reduction in demand for the system.

### 2.1 Hypothesis development

The literature review has shown the importance of public transport for society [1, 4, 15]. Although, the situation caused by COVID-19 has put many things to the test, including the policy and image of public transport for its users. The economic

viability of the entire public transport system has been affected, and in the future, public administrations will need to increase subsidies paid to guarantee the correct and effective work of public transportation system. Another piece of information to consider is that after lockdown, public transport has not recovered the percentage of users that it had before the pandemic [16, 18]. Reasons for this may include: fear of infection, permission to work from home, or not having the job because of the pandemic.

In Spain, the biggest city is Madrid, having integrated and high-quality public transport system [28, 29]. Madrid public transport is equipped with a wide range of possibilities when it comes to moving around, has discounts and bonuses for its users, and has a system adapted for the mobility for everyone. However, there is currently no literature on the impact of the pandemic on public transport in Madrid. In view of the above conclusions, the aim of this study is to analyze the perception of public transport users following the policies implemented on the health crisis marked by the COVID-19. According to Rincon-Novoa et al. [30], analyzing consumer behavior from the user's perspective is a topic of interest for public policy, in a context where consumers try to avoid agglomerations. Therefore, the following hypotheses and research question are raised:

RQ1: How the health crisis caused by pandemic has impacted public transport users' social perception?

H1: Policies by COVID-19, which have been adopted specifically in the metro and bus services, affect the perception of safety of both modes of public transport.

H2: Public reporting of increases in cases and outbreaks of COVID-19 has affected users' public transport decisions.

In order to respond to these hypotheses and research question, the city of Madrid has been taken as a pilot test, a city with a high degree of development of public transport networks, considered to be modern and efficient, where urban and suburban transport coexist. This will allow us to obtain a first approximation of the impact that this health crisis is generating on the public transport sector and then to carry out an analysis in other Spanish cities and other capitals of the world.

## 3. Sample, methodology and questionnaire

### 3.1 Sample and data collection

First, it is necessary to estimate the sampling error, and we can use the following Random Sampling Error Formula, where:

$$K = 2\sqrt{[(p\ (1 - p)/n]} \tag{1}$$

The size of the sample, n, is determined, 1159 surveys. For p, we assume maximum dispersion, where all elements in the questions have the same probability of being chosen: p = q = 0.5. Therefore:

$$p\ (1 - p) = \text{dispersion} = 0.25 \tag{2}$$

So, we get that K for the questionnaire is 2.94%. On balance, the results obtained in our sample of 1159 surveys will fluctuate by +/− 2.94% at a 95% confidence level in the total population. Responses were collected during the months of July–September 2020.

In order to analyze the extent to which the sample represents the population of Madrid, we compared the main characteristics of this city (with data updated to January 1, 2022, according to the Spanish National Institute of Statistics) with those of the sample. In relation to gender, 48% of the population is male and 52% female. In the sample, the gender distribution was somewhat higher for male respondents (55%). In relation to age, 33% of the population is between 16 and 30 years old, which coincides exactly with the percentage of respondents of this age in the sample. We obtained a higher percentage of respondents between 31 and 50 years of age (50%); however, in the population, this age range represents 31%. In terms of geographic distribution, approximately 50% of the population lives in the capital city of Madrid and 50% in other municipalities. In the sample, 51% of the respondents live in Madrid, 44% in other municipalities, and the rest in other communities in Spain. Finally, if we compare the employment rate, we find that around 60% of the population of Madrid is employed, and in the sample, 70% of those surveyed stated that they were actively working.

For all of the above reasons, the sample is considered to represent the population of Madrid in a significant way.

### 3.2 Methodology

Firstly, the Bitner's Servicescape Model [19] is used to assess the social perceptions of public transport users. In this way, we will answer the research question 1 raised in this study. This model considers elements that conform to the environment in which the service is produced in order to understand consumers' behavior and observe how it influences certain changes in their purchase decisions. The justification for this model lies in the idea that the physical environment in which a service is provided directly affects the assessment, perception, and satisfaction of the user, since the service is produced and consumed simultaneously. Gao et al. [31] support the idea that certain environmental characteristics influence consumer behavior. The model contemplates three clearly differentiated parts that lead to understanding the social perception of a service:

1. Environmental dimension: understood as the physical and functional space where the service is provided. It generates in the user what the model defines as "first impressions" of the service.

2. Internal responses: more internalized sensations of the user, such as cognitive, emotional, and physiological responses, which arise from the interaction with the service and its environment.

3. Behaviors: after the experience with the service, the user may manifest approaching and avoiding behaviors, which, in turn, have an impact on social interactions.

These concepts related to the Servicescape model have been applied by numerous authors in their research studies [32–36].

The second part of the analysis is based on linear regression and the correlation table to answer the hypotheses raised in this work. Two different models of regression have been elaborated, one with the dependent variable Sec-Cov Bus and another with Sec-Cov Metro (for explanation of variables see annex).

### 3.3 Research questionnaire

The questionnaire consisted of three blocks based on the Servicescape model. Apart from these three blocks, the questionnaire includes basic questions (e.g., age and gender). The distribution of the questions according to the Servicescape model is explained as follows (Annex shows all questionnaire and its codification used in this study).

In the first block (questions 7–13) about users' first impressions, questions are asked regarding the quality of the environment where the service is provided (air, temperature, noise, smell, space, etc.), about the feeling of safety in the context of COVID-19, among other.

Respect to the "feelings" block (14–19), the questions are more focused on internal user responses, such as whether they reduce the use of public transport if they feel sick, whether it is affected by the number of infected cases reported in the news or where they perceive greater risk of contagion.

Finally, in the behavior block (20–25), questions were included about the reasons for using public transport, the importance of certain service objectives and the services cost increase for user.

The first question of the questionnaire generates a very important distinction between the frequent user and the non-user citizen. If the respondent claims not to be a frequent user, the only valid answers will be those with (**) in the questionnaire (see Annex).

The questionnaire was validated by means of the KMO index and Bartlett's test of sphericity test. The result confirmed the reliability of the questionnaire (KMO = 0.827). After this, Cronbach's alpha was made, where the result was 0.744. Based on this, we can say that the questionnaire was reliable [37].

## 4. Results and discussion

First, the socioeconomic profile of the respondents is described briefly. In terms of gender, 45% of the respondents are women and 55% men. The 50% of the respondents are aged between 31 and 50, with the second largest group, at 33%, being aged between 16 and 30. The predominant employment situation, with 72%, is full-time work, followed by students with 17%. Likewise, 51% of surveyed people live in the Madrid, while 44% claim to live in other municipalities in the Community of Madrid, a minority from another Spanish community and from abroad.

Other important result in this study is that 73% claim to be frequent users of public transport, which indicates a mobility behavior where the use of the bus and the metro instead of the private transport. However, 60% of the respondents said that they had reduced their use of public transport because of the COVID-19.

### 4.1 Servicescape model

Based on user responses, the Bitner's Servicescape Model on social perception of public transport in COVID-19 context is analyzed. This will provide an answer to the research question 1.

### *4.1.1 Block 1: "first impressions"*

In terms of air quality, temperature, noise, cleanliness, smell, and space, bus transport environment is better valued than metro transport. With respect to the feeling of security in the COVID-19 context, there is no positive response in none of the modes of transport. Although, in case of the metro, users reflect a clearer trend due to feeling of bad security.

On the other hand, it seems that the indications on safety measures by COVID-19 are indifferent in both modes of transport, although in the case of busses, they are somewhat better-valued. Likewise, the treatment of employees in general seems to be well appreciated by users.

### *4.1.2 Block 2: "feelings"*

The users clearly state that they avoid using public transport if they feel sick. In COVID-19 context, it may indicate that the user takes precautions to avoid contagion and actively participates in preventing its spread.

In general terms, the younger is the age of users, the greater is the reduction in the use of public transport. Also, there is a clear trend to state that the use of transport is reduced when the number of reported cases of contagion increases. The user is indifferent when it comes to evaluation of public transport in Madrid as efficient, modern, and prepared for the pandemic.

Users perceive, in 57% of cases, that the bus has a lower risk of contagion, in 33% of cases they consider that the risk is the same in both cases, and in the remaining 10%, they consider that it is the metro that has a lower risk.

Regarding the open question, about the image with which public transport is associated in the city of Madrid, we have typified the answers obtained based on a common denominator. **Figure 1** shows the percentages recorded:

The most received answers are related to the poor quality of the service, specifically to the image of agglomerations of citizens using transport. Some of the most recorded responses are those related to COVID-19. Specifically, respondents indicated

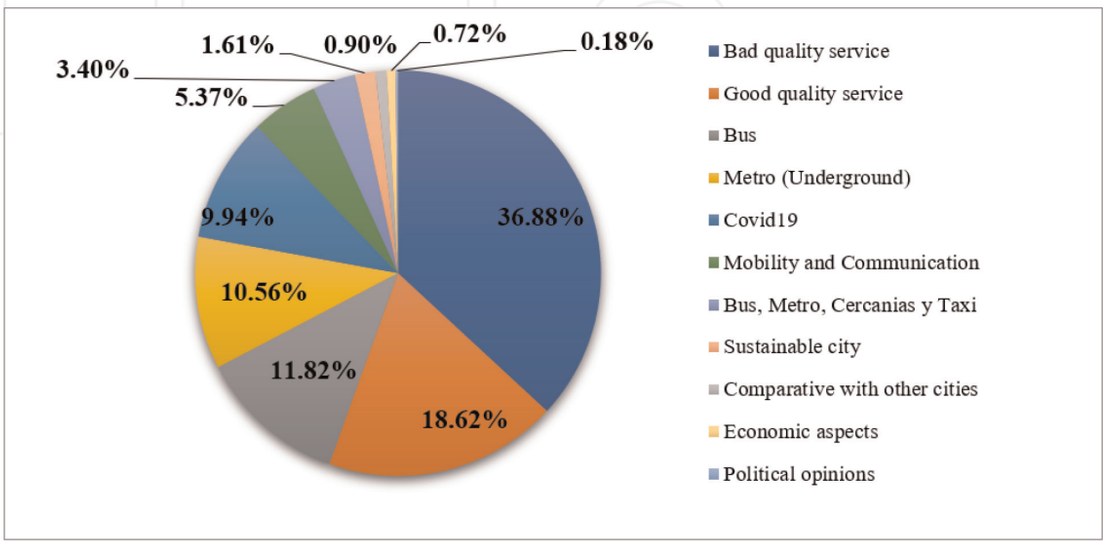


**Figure 1.**
*Typified answers about the image of public transport in the city of Madrid. Source: own elaboration.*

issues such as "risk," "contagion," "masks," "safe distance," and "COVID-19" as indicators that the public transport service is now strongly associated with the pandemic.

*4.1.3 Block 3: "behavior"*

The results obtained have shown a mandatory reason for using public transport, mainly due to financial savings and lack of a private car. High volume of answers reported that the users using public transport mainly for work purposes and not for leisure activities.

In relation with the service's objectives, **Figure 2** shows a ranking. This ranking allows to obtain the value or importance that users attach to the following service objectives:

- Waiting times or frequency of service [Tobjet-freq]
- Safety feeling [Tobjet-safety]
- Level of technological development [Tobjet-ICT]
- Speed or travel time [Tobjet-speed]
- Universal accessibility to the service for all users [Tobjet-Univaccess]
- Comfort sensation, quality of space, temperature.... [Tobjet-space]
- Contribution to environmental sustainability [Tobjet-sustainab]

In none of them is the average rating below 4 ("important"), so they are all considered essential for public transport. However, two objectives stand out from the others, frequency and safety. Therefore, in current situation affected by the pandemic, greater security, which may be related to possible contagion, is a key objective for the user. Frequency, on the other hand, can also lead to greater safety, since it contributes to a lower volume of "crowded" passengers on each train at peak times and can reduce the risk of contagion.

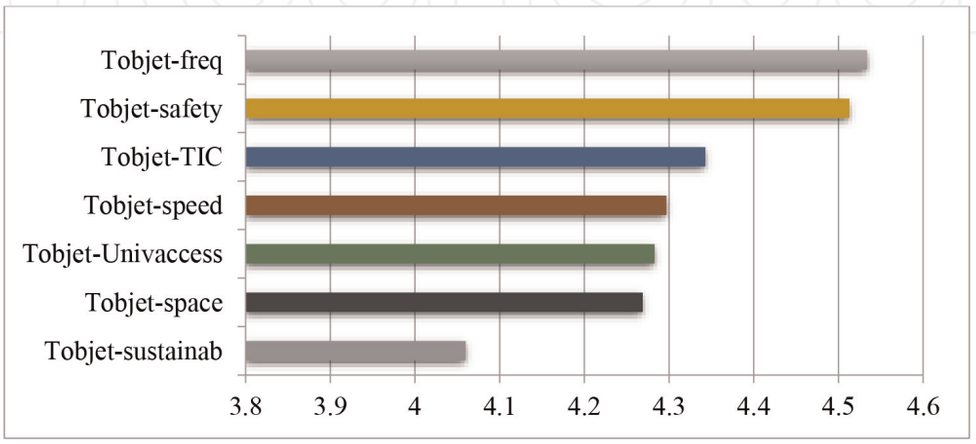


**Figure 2.**
*Objectives' ranking in public transport by users (sorted by average rating). Source: Own elaboration.*

Finally, the responses on cost increase of the service for users to have a greater safety by COVID-19 reflect quite a dispersion. However, the tendency toward conformity is a little clearer if the respondent is asked about sharing this cost over all citizens, not just users, as it results in greater safety for all.

### 4.2 Correlation and linear regression

In this section, we will answer the hypotheses raised above. The dependent variables for testing the hypotheses were users' perceived safety during the pandemic in metro (Sec-Cov Metro) and bus (Sec-Cov Bus). The following variables have been used for explaining the dependent variables: EQ Bus, EQ Metro, Safe-Signal Metro, Safe-Signal Bus, BvsM riskCov, TP-COV, and Tuse-CI (see Annex for more details).

Therefore, the correlation matrix was made (see **Table 1**) where the link between dependent variables and independent variables was shown. There is a strong relationship between dependent variables and explanatory variables as the perceived quality of services and the indications on safety measures during the pandemic. There is an interesting correlation between dependent variables and the news reports about increase in COVID-19-infected cases. As the relationship is negative, this result suggests that when the reports about number of COVID-19-infected cases were going down, users' feelings about the safety to use the public transport were increasing.

However, it should be noted that the correlation results are not conclusive. For this reason, a linear regression analysis has been carried out to confirm the previous

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Sec-Cov Bus | 1 | | | | | | | | |
| Sec-Cov Metro | 0.6136* | 1 | | | | | | | |
| | 0.0000 | | | | | | | | |
| EQ Bus | 0.7144* | 0.4305* | 1 | | | | | | |
| | 0.0000 | 0.0000 | | | | | | | |
| EQ Metro | 0.4096* | 0.6407* | 0.5187* | 1 | | | | | |
| | 0.0000 | 0.0000 | 0.0000 | | | | | | |
| Safe-Signal Bus | 0.7137* | 0.5191* | 0.6382* | 0.3980* | 1 | | | | |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | | | |
| Safe-Signal Metro | 0.4948* | 0.6551* | 0.4470* | 0.5338* | 0.7406* | 1 | | | |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | | | | |
| BvsM riskCov | −0.2402* | 0.0588* | −0.2422* | 0.0443 | −0.2058* | −0.0393 | 1 | | |
| | 0.0000 | 0.0452 | 0.0000 | 0.1319 | 0.0000 | 0.1812 | | | |
| TP-COV | 0.5520* | 0.5491* | 0.4651* | 0.4180* | 0.5008* | 0.4603* | −0.0845* | 1 | |
| | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0040 | | |
| Tuse Tuse-CI | −0.2034* | −0.1763* | −0.1324* | −0.0716* | −0.1536* | −0.1224* | 0.0602* | −0.1038* | 1 |
| | 0.0000 | 0.0000 | 0.0000 | 0.0148 | 0.0000 | 0.0000 | 0.0406 | 0.0004 | |

*$P < 0.05$.

**Table 1.**
*Correlation matrix.*

| | Sec-Cov Bus | | Sec-Cov Metro | |
|---|---|---|---|---|
| **Variables** | **Coef.** | **P > t** | **Coef.** | **P > t** |
| Sec-Cov Metro / Sec-Cov Bus | .4294593 | 0.000 | .4907204 | 0.000 |
| EQ Metro | −.1396575 | 0.000 | .3563101 | 0.000 |
| EQ Bus | .4264429 | 0.000 | −.2300399 | 0.000 |
| Safe-Signal Bus | .4538899 | 0.000 | −.2030143 | 0.000 |
| Safe-Signal Metro | −.2423583 | 0.000 | .3945092 | 0.000 |
| BvsM riskCov | −.1114827 | 0.000 | .1407047 | 0.000 |
| TP-COV | .0849451 | 0.000 | .1374505 | 0.000 |
| Tuse-CI | −.0361566 | 0.012 | −.0461876 | 0.003 |
| _cons | .266723 | 0.013 | −.3311515 | 0.004 |

**Table 2.**
*Results of the linear regression.*

results. Two regression models have been made with each of the dependent variables (see **Table 2**). The result has shown that the explanatory variables justify an overall 73% (r2) of the proposed model for the variable Sec-Cov Bus and 69% (r2) for the dependent variable Sec-Cov Metro. Furthermore, the p-value was 0.00 for both models.

The Durbin-Watson statistic has shown the result of 2.01 for the model Sec-Cov Bus and 1.97 for the model Sec-Cov Metro. Through this statistic, the independence of the residuals is detected when it is between 1.5 and 2.5 [38]. In this model, we can assume that the residuals are independent.

In model one, the dependent variable is Sec-Cov Bus, and the Sec-Cov Metro variable is an independent variable. In model two, the dependent variable is Sec-Cov Metro, and the Sec-Cov Bus variable is an independent variable. In both models, we can see that when the user's feeling of safety increases in one mode of transport, it also increases in the other.

In model one, if the perceived quality of service (in terms of air quality, temperature, noise, cleanliness, smell, and space) and the safety signs on bus are well rated, the feeling of safety increases on bus. The same is true for metro in model two. On the contrary, there is an inverse relationship between two modes of transport: if the perceived quality of service and the safety indications on metro decrease, this causes the feeling of safety on bus to increase. This is probably, because the user sees bus as safer than metro. Otherwise, the same is true for metro.

On the other hand, we can see how if users associate metro and bus with efficiency and transport prepared for the pandemic situation, the safety feeling is enhanced when using bus and when using metro. Finally, in relation with the variable Tuse-CI, we can see that when the public transport users' see that the number of infected people drops in, the feeling of safety on bus and metro improves.

## 5. Conclusions

The results obtained show that in Madrid, there is a high use of public transport. However, because of the health crisis caused by COVID-19, users are trying to reduce

their use as much as possible. This may be due to different reasons. On the one hand, it could be the increase in teleworking, which makes travel for work purposes less necessary. On the other hand, users are increasingly trying to avoid contagion and avoid using this service for non-obligatory travel.

Through the Servicescape Model, we have obtained the following social perceptions on the use of the service in COVID-19 context, answering the research question posed:

1. Users do not value public transport in Madrid as a service prepared for COVID-19. It seems that the policies adopted, or the lack of them, do not contribute to a perception of safety for citizens. In this sense, there is a greater perception of risk of contagion in the metro than in the bus, so policies should be aimed at providing a safer service in the metro and give greater confidence and reliability to the user. The citizens are also willing to bear the increased cost as a burden that results in greater safety for all.

2. User takes precautions to avoid contagion and actively participates in preventing its spread, so reduces the use of public transport as much as possible. The younger is the age of users, the greater is the reduction in the use of public transport. In colleges and universities, part of the teaching is done online, and the policies adopted are aimed at reducing the mobility of these groups. In this sense, we could confirm that the policies are fulfilling their objective.

3. The public transport service is strongly associated with the pandemic. Then, users give a higher priority and assessment to the frequency of the service, for greater control of capacity and the security of the environment where the service is offered.

4. Those users who use public transport for work purposes cannot so easily reduce the use of this service. This fact, together with the use of the service for reasons of economic savings and lack of a private car, reflects obligatory mobility patterns [39, 40]. It could therefore be said that the decision to reduce the use of public transport will mainly affect leisure travel, with the consequent impact on consumption and the economy.

With respect to the first hypothesis, we can confirm thatthe data recorded show that the policies adopted specifically for the bus and metro service affect the perception of safety of both services together. The model also identifies the key issues on which policies need to take action to increase confidence in public transport safety and avoid COVID-19 risk. Specifically, the quality of the service provided, in terms of air quality, temperature, noise, cleanliness, smell, and space, the indications of safety measures, and the way in which cases of contagion and their evolution are reported. The second hypothesis is confirmed since the increase in reported cases affects mobility patterns and contributes to the reduction in the use of public transport. This statement supports the need to ensure that the information that is transferred about contagion is reliable and comparable over time, since it can affect citizens' mobility patterns.

## A. ANNEX. Questionnaire for public transport user perception in the context of COVID-19

| **Question/Variable name** | **Possible answers/Code** | | | | |
|---|---|---|---|---|---|
| 1. Are you a frequent user of public transport in the city of Madrid? / **Freq-user TM** | YES **1** | | | NO **0** | |
| 2. Gender / **GEN** (**) | Female **1** | | Male **2** | I do not want to answer **0** | |
| 3. Age / **AGE** (**) | Between 16 and 20 **1** | Between 31 and 50 **2** | | Between 51 and 65 **3** | Over 65 **4** |
| 4. Situación laboral / **EMP-SIT** (**) | Student **1** | Part-time worker **2** | Full-time worker **3** | Unemployed **4** | Retired **5** | In a situation of ERTE **6** |
| 5. Live in / **PL-RES** (**) | Madrid City **1** | Another municipality in the Community of Madrid **2** | | In another Spanish community **3** | Abroad **4** |
| 6. Have you reduced the use of public transport as a result of COVID19? / **T-USE Covid19** | YES **1** | | | NO **0** | |
| 7. How do you perceive the quality of service in EMT busses in Madrid, in terms of air quality, temperature, noise, cleanliness, smell, and space / **EQ Bus** | **1** (very bad) | **2** (bad) | **3** (neutral) | **4** (good) | **5** (very good) |
| 8. How do you perceive the quality of the service in Metro of Madrid, in terms of air quality, temperature, noise, cleanliness, smell, and space / **EQ Metro** | | | | | |
| 9. How do you assess the feeling of safety in the context of COVID-19 in EMT busses in Madrid? / **Sec-Cov Bus** | | | | | |
| 10. How do you assess the feeling of safety in the context of COVID-19 in Metro of Madrid? / **Sec-Cov Metro** | | | | | |

| Question/Variable name | Possible answers/Code | | | | |
|---|---|---|---|---|---|
| 11. The indications on safety measures for COVID 19, in EMT busses in Madrid are considered to be... / **Safe-Signal Bus** | | | | | |
| 12. The indications on safety measures for COVID 19, in Metro de Madrid consider that they are... / **Safe-Signal Metro** | | | | | |
| 13. The treatment of employees is considered to be (driver, ticket agents, security guards...) / **Employ-relat** | | | | | |
| 14. If you feel sick, try to avoid using public transport / **Tuse sick** (**) | **1** (strongly disagree) | **2** (disagree) | **3** (neutral) | **4** (agree) | **5** (strongly agree) |
| 15. When the news reports an increase in cases and regrowth, affects you to decide use public transport / **Tuse-CI** (**) | | | | | |
| 16. Do you associate Madrid's bus and metro transport with modernity, efficiency, and transport prepared for the COVID-19 situation / **TP-COV** (**) | | | | | |
| 17. Have you replaced public transport with private transport or other modes of transport (cycling, walking...) as a result of the COVID-19 / **TS-COV** | | | | | |
| 18. Which of the two transports do you consider to have the least risk against COVID-19, bus or metro? / **BvsM riskCov** (**) | BUS (EMT of Madrid) **1** | | METRO **2** | Both equally **3** | |
| 19. If you hear about public transport in the city of Madrid, what image/ideas comes to mind / **Timage** (**) | Open answer (see **typified answer** in **Figure 1**) | | | | |

| **Question/Variable name** | **Possible answers/Code** | | | | |
|---|---|---|---|---|---|
| 20. You use public transport mainly for / **Tuse reason** | For time saving **1** | For social awareness **2** | For economic saving **3** | For lack of a private car **4** | Other **5** |
| 21. Use public transport for work purposes / **Tuse-JOB** | **1** (not at all) | **2** (a little) | **3** (sometimes) | **4** (often) | **5** (very often) |
| 22. Use public transport for leisure purposes / **Tuse entertainm** | | | | | |
| 23. Graduate the importance of the following objectives in public transport: Waiting times/frequency **Tobjet-freq** Speed/travel time **Tobjet-speed** Comfort, space, temperature… **Tobjet-space** Security **Tobjet-safety** Universal Accessibility **Tobjet-Univaccess** Technological development **Tobjet-TIC** Environmental sustainability **Tobjet-sustainab** | **1** (very unimportant) | **2** (unimportant) | **3** (neutral) | **4** (important) | **5** (very important) |
| 24. Agree with the increased cost of the service to provide greater security by COVID-19 / **Cost-inc safeCov** (**) | **1** (strongly disagree) | **2** (disagree) | **3** (neutral) | **4** (agree) | **5** (strongly agree) |
| 25. The increase in costs must be cover by all citizens as it is in the interest of greater security for all / **Cover cost citizens** (**) | | | | | |

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