



DEPARTMENT OF CIVIL, GEO AND
ENVIRONMENTAL ENGINEERING

TECHNISCHE UNIVERSITÄT MÜNCHEN

Bachelor's Thesis in Civil Engineering

Exploring social media strategies for transport planning

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Exploring social media strategies for transport planning

A mixed-methods study

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Submission Date: April 2, 2021

I confirm that this bachelor's thesis in civil engineering is my own work and I have documented all sources and material used.

Munich, April 2, 2021

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Acknowledgments

First of all, I would like to thank my two tutors M.Sc. David Telmo Duran Rodas and M.Sc. Ulrike Jehle for all the support they have given me. Not only have they supported me, motivated me, and taught me many things during these five months, but also their gentle and kind attitude has helped me to improve as a person.

I would also like to thank and dedicate this thesis to all my family. Without you, none of this would have been possible. Thank you for guiding me, motivating me, and always being by my side.

Finally, I would like to thank all the people who helped me contact the necessary people to conduct the different interviews required in the study.

BACHELOR'S THESIS

Degree Course: Civil Engineering

Guerrero Calderon, Leonel

03693739

Project Schedule: 02.11.2020 – 02.04.2021

Subject: How public transportation agencies are using social media and which strategies have been successful?

Background and Goals:

The use of public transportation is a key factor to decelerate the climate change. Nearly one third of the greenhouse gas emissions produced in the United States and Europe come from the transportation industry [1]. Public transportation will help mitigate these impacts up to a 76% (for subways and metros) in comparison to private vehicles. Also, public transportation allows a more efficient land use. Thus, the width of roads and space for car parking could be potentially reduced. [2]

Prior to social media, many public institutions used their websites as an attempt to create an interactive platform for stakeholders. This effort was not as successful as desired because the institutions were not able to share important information quickly or to engage citizens to dialogue [3]. Studies have also shown that public institutions, and specifically many public transportation agencies have bad reputation among the citizens. For instance, many of the comments posted by citizens gathered on Twitter criticize the services offered by the responsible public transportation agencies [4].

According to recent studies, in 2020 around 3.6 billion people are using social media worldwide and it is expected that 4.4 billion will use these platforms until 2025 [5]. Social media is not only used to reach family members, friends or work contacts. Lately, it has been used to discuss political agendas, campaigns and policy processes, and to inform about emergency situations and natural disasters. Therefore, governmental institutions have begun to be more active in social networks [6].

For public transportation agencies, social media has been a powerful tool since it allows to share real-time service updates and general messages to the public. Moreover, social networks offer a new space to post projects updates, for audiovisual marketing, customer service and for community building [7]. The use of social media must be carefully carried out because a lot of citizens use them to criticize and post negative

comments online [4]. Thus, public transportation agencies should counter-attack these comments trying to build civic engagement and trust through social media [8] and adapting to the use of new features in social media. Therefore, it is necessary for transportation agencies to set objectives for social media and evaluate the methods used [7].

The aim of the study is to explore a) how public transportation agencies are using different platforms, and b) which strategies have been successful to communicate to the public, and thus, to generate a positive impact on the citizens to increase the use of public transportation.

Methods:

This study is going to be carried out through an analysis of the content on social media posts by public transportation agencies over a period and through interviews with different public transportation agencies to see how they have been using social media and which strategies have been successful.

To have a basic understanding on how social media works, it is required to do a literature review on the state-of-the-art of social media, which types of social media exist, the different benefits they have and the usage by public transportation agencies. Then, posts made by different transportation agencies through a lapse of time will be collected. These will be clustered in different topics. This will exemplify which issues are being addressed on the social media of the public transportation agencies and identify which issues are most liked by the readers. Finally, interviews will be carry out with five different public transportation agencies to gain a deeper understanding and validate the quantitative results. Moreover, interviews will help us to understand which objectives the companies had, how they performed on social media and, if there were any reasons to change the methods used.

The results of this study will help transportation agencies to improve and adapt better to social media and, therefore, to communicate important (or even urgent) information to the right audience, and eventually generate a positive impact on the citizens. The results are expected to contribute to the reduction of the usage of private vehicles and increase the usage of public transport and therefore, to reduce the greenhouse gas emissions on the planet.

Supervision:

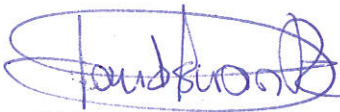
The Bachelor's Thesis is supervised by M.Sc. David Telmo Duran Rodas and M.Sc. Ulrike Jehle, Chair of Urban Structure and Transport Planning, TUM. The scientific responsibility of the work lies fully with the candidate while TUM will provide scientific supervision assistance. The candidate will develop a structural draft of his thesis within two weeks from the date of issue of the thesis and discuss it with his supervisors. Further consultation appointments will be arranged between candidate and supervisors as required.



Prof. Dr.-Ing. Gebhard Wulfhorst



M.Sc. Ulrike Jehle



M.Sc. David Telmo Duran Rodas
(mobil.Lab Doctoral Research Group)

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Abstract

The transport sector is responsible for one-third of greenhouse gases in Europe and America [1]. The private vehicle fleet, responsible for a large part of greenhouse gases, also causes a disproportionate use of urban space, because a private vehicle, with the same occupancy rate, requires eight times more space than public transport [2]. To reverse these effects, it is necessary to have a public transport system that meets citizens' needs. Therefore, it is required to establish two-way communication, in which public transport agencies can communicate important information and users can give suggestions, complaints, or comments about the service.

Social networks offer an ideal platform for public transport agencies because the number of users is increasing, information is communicated quickly, and users can converse with them. Because of this, this study focused on exploring a) how public transport agencies use social media, and b) what strategies have been successful in planning and improving public transport service.

To explore these questions, an explanatory mixed-method approach was used. First, Facebook and Twitter posts were collected from five public transport agencies in Europe and Latin America during 2014, 2017, and 2020. Each post was assigned tags to summarize the content and type of post. Afterward, interviews were conducted with three public transport agencies (the same ones, from which the data were collected) to gain details about the collected information. Using this method combines the advantages of qualitative and quantitative data, and reduces the limitations of using only one of these two strategies.

Despite having certain similarities in the use of social networks and the strategies employed, the results showed that each agency has unique strategies. The results allowed the creation of a table with the most successful strategies used since 2014, taking into account the characteristics of the cities in which the agency operates. It is hoped that public transportation agencies will use this study to improve their service, and thus contribute to the environment and the proper use of urban space.

Kurzfassung

Der Verkehrssektor ist für ein Drittel der Treibhausgase in Europa und Amerika verantwortlich [1]. Die PKW-Flotte, die für einen großen Teil der Treibhausgase verantwortlich ist, verursacht auch eine unverhältnismäßige Nutzung des urbanen Raums, da ein PKW bei gleicher Auslastung acht-mal mehr Platz benötigt als der öffentliche Verkehr [2]. Um die negativen Auswirkungen des Individualverkehrs umzukehren, ist es notwendig, ein öffentliches Verkehrssystem zu haben, das die Bedürfnisse der Bürger erfüllt. Dazu ist es notwendig, eine zweiseitige Kommunikationslinie zu etablieren, in der die Verkehrsbetriebe wichtige Informationen kommunizieren und die Nutzer Anregungen, Beschwerden oder Kommentare zum Service abgeben können.

Soziale Netzwerke bieten eine ideale Plattform für Verkehrsbetriebe, da sie von immer mehr Menschen genutzt werden, Informationen zügig übermittelt werden und die Nutzer sich mit den Verkehrsbetriebe unterhalten können. Aus diesem Grund konzentrierte sich diese Studie darauf, zu erforschen, a) wie ÖPNV-Agenturen verschiedene soziale Netzwerke nutzen und b) welche Strategien sich als erfolgreich erwiesen haben, um den ÖPNV-Service zu planen und zu verbessern.

Um diese Fragen zu untersuchen, wurde ein erklärender Mixed-Methods-Ansatz verwendet. Zunächst wurden Facebook- und Twitter-Posts von fünf öffentlichen Verkehrsbetrieben in Europa und Lateinamerika in den Jahren 2014, 2017 und 2020 gesammelt und analysiert. Jedem Beitrag wurden Tags zugewiesen, um den Inhalt und die Art des Beitrags zusammenzufassen. Anschließend wurden Interviews mit drei Verkehrsbetrieben geführt (dieselben, von denen die Daten gesammelt wurden), um Details über die gesammelten Informationen zu erfahren. Die Verwendung dieser Methode kombiniert die Vorteile von qualitativen und quantitativen Daten und reduziert die Einschränkungen, die bei der Verwendung nur einer dieser beiden Strategien bestehen.

Trotz gewisser Ähnlichkeiten bei der Nutzung von Social Media und den eingesetzten Strategien zeigten die Ergebnisse, dass jede Agentur einzigartige Strategien hat. Die Ergebnisse erlaubten es, eine Tabelle mit den erfolgreichsten Strategien zu erstellen, die seit 2014 eingesetzt wurden, wobei die Merkmale der Städte, in denen die Agentur tätig ist, berücksichtigt wurden. Es ist zu hoffen, dass die Verkehrsbetriebe diese Studie nutzen, um ihren Service zu verbessern und damit einen Beitrag zum Umweltschutz und zur richtigen Nutzung des städtischen Raums zu leisten. Die Anzahl der Benutzer steigt.

Resumen

El sector de transportes es responsable de un tercio de los gases con efecto invernadero en Europa y en América [1]. La flota de vehículos privados, responsable de gran parte de los gases de efecto invernadero, también causa un uso del espacio urbano desproporcionado, ya que un vehículo privado, con el mismo porcentaje ocupacional, requiere 8 veces más campo que el transporte público [2]. Para poder revertir los efectos negativos de los vehículos particulares, es necesario contar con un sistema de transporte público que satisfaga las necesidades de los ciudadanos. Para ello, es necesario establecer una línea bidireccional de comunicación, en la cual las agencias de transporte público puedan comunicar informaciones importantes y los usuarios puedan dar sugerencias, quejas, o comentarios sobre el servicio.

Las redes sociales ofrecen una plataforma ideal para las agencias de transporte público, ya que cada vez más personas las usan, se transmiten las informaciones de manera expedita y se puede conversar con los usuarios. Debido a esto, este estudio se centró en investigar a) cómo usan las agencias de transporte público las diferentes redes sociales, y b) cuáles estrategias han sido exitosas para planear y mejorar el servicio de transporte público.

Para explorar estas preguntas se usó un método mixto explicativo. Primero se recolectaron publicaciones de Facebook y Twitter de cinco agencias de transporte público de Europa y América Latina durante el 2014, 2017 y 2020. A cada publicación se le asignaron etiquetas para resumir el contenido y el tipo de publicación. Después, se realizaron entrevistas con tres agencias de transporte público (las mismas de los que los datos fueron recolectados) para obtener más detalles sobre la información recolectada. Utilizando este método se combinan las ventajas de los datos cualitativos y cuantitativos, y se reducen las limitaciones de utilizar sólo una de estas dos estrategias.

A pesar de tener ciertas similitudes en el uso de las redes sociales y de las estrategias empleadas, los resultados demostraron que cada agencia tiene estrategias únicas. Los resultados permitieron crear una tabla con las estrategias más exitosas usadas desde el 2014, tomando en cuenta las características de las ciudades en las que la agencia opera. De esta manera se espera que las agencias de transporte público utilicen este estudio para mejorar su servicio, y así contribuir con el medio ambiente y el uso adecuado del espacio urbano.

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1. Introduction

1.1. Background

Climate change is one of the most threatening challenges that humans are facing in this century [3]. It impacts human health, the environment and the economies from around the globe [3]. Often the governments ignore, underestimate, or simply do not have the necessary resources to combat climate change.

Climate change occurs due to the increase of human activities pouring greenhouse gas emissions and in particular carbon dioxide (CO₂) into the atmosphere and the oceans. This effect traps heat in the atmosphere generating global warming. The average temperature of the global surface has increased around 1 ° Celsius since 1880. The trend of recent years shows an acceleration in the increase of the temperature. This acceleration of global warming triggers temperature and precipitation changes, rising sea levels, and melting glaciers. In this century, these impacts could cost the countries around 20% of the gross domestic products. The repercussions will be unevenly distributed across countries, leading to more loss of life, inequalities, less power of action from the governments, and more health issues associated with global warming [3].

Nearly one-third of the GHG emissions issued in Europe and America are produced by the *transportation industry*, being the *second* largest source just behind the electric power industry [1]. Beyond the environmental impacts, transportation has a direct impact on the health of the citizens, land use, traffic, and accidents. Only transit accidents cost in most of the countries over 3% of their gross domestic product. Each day around 3,500 people around the globe die on the roads and tens of millions suffer injuries or disabilities each year [4]. Despite all these factors, the private vehicle stock is increasing and will surpass over two billion units in 2030 [5]. Therefore, to minimize these issues an alternative to driving is necessary.

A different option to stop traveling with private vehicles is public transportation. This mode of transport is a low-carbon mobility option and therefore, helps reduce the greenhouse gas emissions up to 76% (for subways and metros) in comparison with private vehicles [1]. Also, public transportation allows a more efficient land use. With an average occupancy rate of 40% (or 1.28 passengers) a private car requires 47 m² per person. On the other hand, for buses and streetcars, with the same occupancy rate, only 6 m² are needed [2]. Therefore, the width of roads could be potentially reduced and more public transportation lanes, wider bicycle paths, and wider sidewalks can be built. The use of public transportation makes the use of land fair by providing access for individuals, regardless of their socioeconomic status,

to goods, services, and information. Thus, cities increase their economic growth and the well-being of the citizens [6].

1.2. Needs

To reduce global warming and have more environmentally friendly cities, it is necessary to increase the usage of public transportation. Therefore, Public Transportation Agencies (PTAs) have to offer their services in a way that travelers' needs are met [7]. For this to happen, it is necessary to establish direct communication between the riders and the Public Transportation Agency (PTA).

PTAs tried using their static websites as an attempt to create an interactive platform for stakeholders. This effort was not successful because of the lack of engagement from the citizens [8]. Additionally, traditional customer services channels (e.g telephone and email) are very time-consuming and error-prone, which could lead to loss of clients [9].

Therefore, PTAs had to search for new alternatives to engage the citizens and offer better and quicker customer service. A two-way communication channel between the citizens and the PTA is necessary, where: 1) riders will be able to express their needs, critics and compliments towards the service offered and 2) PTA will share timely updates and public information, reach for new riders, have a quick and effective customer service, and build engagement with the community [10]. This communication channel would enable that PTA plan and improve their services based on the needs of the riders. An alternative platform that allows PTA to deliver better public services and create two-way communication with the citizens are social networks [11].

Recent studies have shown that in 2020 around 3.6 billion people are using social media and it is expected that 4.4 billion people will use these platforms in 2025 [12]. Around 98% of the social media users have access to the platforms via mobile devices, which makes these networks accessible from almost anywhere in the world [13]. Consequently, social media became more than just a platform used to reach family members, friends, or work contacts. They are used to discuss political agendas, campaigns, and policy processes, to inform the public about emergencies, and to inform about natural disasters [11].

Therefore, the participation of public institutions, including PTA, in social networks has importantly grown in the last ten years and will continue to do so [14]. PTA have been using this channel for:

- **Real-time service updates** about traffic, delays, route changes due to unexpected events.
- **General messages to the public** e.g routes and schedules, fares, upcoming projects, etc.
- **Citizen engagement** through the interaction between the citizens and the PTA.

- **Marketing** by creating audio-visual content for their brand and reaching for new riders.
- **Research** by simply hearing the feedback of the citizens
- **Customer Service** by encouraging riders to report problems or answering questions through the platform [15].

Even though social networks can be used for all the purposes mentioned above, social media have their disadvantages. Several studies have shown that many public transportation agencies have a bad reputation among the citizens [16]. For instance, a lot of the comments posted by citizens gathered on Twitter criticize the services offered by the responsible PTA [16]. To achieve a better perception of the PTA, to engage more citizens, it is necessary to set the right strategies on these platforms. Also, the PTAs should use this feedback to improve and plan its service based on the needs of its users. By doing this more potential riders are going to be attracted to use public transportation [7].

Although more and more resources are being invested in maintaining active participation in social networks, studies have shown that only 28% of the PTA had a strategy for the use of these platforms [17]. Hence, it is necessary to:

1. Identify the uses that public transportation agencies have given to social networks. It is necessary to know if there is a distinction in the use depending on the platform or if there is a homogeneous use in all platforms.
2. Discover which strategies have been successful in improving public transportation service and information sharing. Thus, it is necessary to compare strategies used throughout the years. Furthermore, it is necessary to consider the characteristics of the cities, to determine if the strategies that were most successful in meeting the objective vary depending on the cities.
3. Find out if companies have used people's feedback to improve public transport services.

1.3. Objectives and Research Question

For the resources invested in social networks to be used adequately, research on the strategies used by PTA on social media has to be made. This study aims to explore a) how public transportation agencies are using the different platforms of social media, and b) which strategies have been successful in using social networks to improve public transportation and thus, generate a positive impact on the citizens to increase the use of this service.

Past research on this topic has focused on recollecting data through Application Programming Interfaces (API), mostly from Twitter, for a short period and then, providing a how-to-guide for transportation agencies [17]. Therefore, this study focuses on analyzing *how* are PTAs using their social media for three different years. Twitter and Facebook are the most used social networks among PTA and therefore, these platforms will be analyzed in this study

[17]. The data needed will be manually recollected for a lapse of time of three years (2014, 2017, and 2020) for each social media. Each year will have a three-year gap to understand better how the strategies have been changing over the years. Thus, the data can be analyzed and compared with the content of the other social networks. This comparison shows which content is most used for each platform and which content could be used in all social networks.

Interviews with three different PTAs, from which data was also recollected, will be carried out, to gain a deeper understanding of how social networks were used and to validate the quantitative results. Moreover, interviews will provide a deeper understanding of the different objectives the companies had, how they performed on social media and if there were any reasons to change the methods used. The interviews will also be used to find out how agencies use user feedback on social networks. Taking into account the different goals from the PTAs, the strategies are analyzed and sorted into how successful or unsuccessful they were in communicating with the citizens and accomplishing the different objectives from the PTA. A ranking will be created, depending on how many interactions each strategy generated, to classify which strategies were successful.

An explanatory mixed method procedure will be used to help answer the research questions. This method includes the collection and analysis of quantitative and qualitative data. First, quantitative data are collected and analyzed. Once the results are obtained, the interview is formulated based on the quantitative data to obtain the qualitative data. In this way, the quantitative data can be explained in more detail and more information can be gained from specific aspects of the data collection with the interviews. Using this approach, attempts are made to combine the advantages of quantitative and qualitative data and to minimize the limitations of quantitative data [18].

Setting the proper strategies on social media to achieve the different objectives will allow the PTA:

1. To reach more people and thus, increase the ridership of public transport.
2. To generate a more positive impact on the citizens by generating engagement.
3. To improve the operation of the transport system by sharing real-time updates and general service information.
4. To plan transportation considering the needs of the riders. [19]

Based on the points listed above, PTAs will have the opportunity to improve their service using the rider's feedback, allowing an increase of transit usage [19]. This increase in ridership may help to contribute to the deceleration of climate change by reducing greenhouse gas emissions. Also, these increases will improve the access to goods, services, and information. By increasing public transport, traffic accidents will be reduced, which will result in lower economic costs. Finally, it will also help to distribute fairer urban space.

1.4. Thesis Outline

- **Chapter 2: Literature Review** An overview of the related work on the use of social networks for PTAs is presented. This chapter also presents a literature review of the different social networks existing, their features and the benefits from which PTA can take advantage of.
- **Chapter 3: Methods** The different methods of data recollection and analysis are described in this chapter. Then, it is explained how interviews are carried out. Finally, the chosen methods and why they were chosen are explained in detail in this chapter.
- **Chapter 4: Results** The results of the data collection, topic clustering and the interviews are presented on this section. It follows the ranking of the successful strategies and the use of these platforms over time.
- **Chapter 5: Discussion** In this chapter the results of the data collection on social media and the interviews are discussed and compared with the literature. Here are presented new features to implement, the best strategies for each target and which content is better to reach new citizens and thus, to increase the usage of public transportation.
- **Chapter 6: Conclusion** A summary of the key points of the thesis is presented on this chapter to answer the research question. This chapter contains new fields of study for future research and how the PTAs could use the results of this study.

2. Literature Review

This chapter is divided into four parts. The first one gives an overview of what social networks are and how have PTAs been using these platforms. Then, an overview of the related work on the use of social media for PTA is given.

2.1. Social Media: Overview

To understand better the meaning of social media, it is necessary to explain the, often interchangeable, concepts of Web 2.0 and user-generated content. The term Web 2.0 was first used around 2004 to describe a new way to use the World Wide Web, in which software developers and end-users can create and modify the content and applications in a collaborative way [20]. Before the presence of Web 2.0, only software developers could create and publish content and applications.

After the Web 2.0 was created the next step towards the foundation of social media was the user-generated content. Even though user-generated content was already available before the creation of Web 2.0, it became popular with the technology that the Web 2.0 offers. User-generated content describes the content (photographs, videos, podcasts, articles, blogs, etc.) that is created by the end-users [20]. For the media to be considered as user-generated content, the following criteria must apply [21]:

1. Content must be publicly available or accessible for a selected group of people on a social network.
2. It must be something with certain creativity. Posting something without any modifications or commenting (for example from a magazine) does not count as UGC.
3. It must be created without professional practices.

Thus, social media is a group of internet applications that use the technology of the Web 2.0 and allows the development of user-generated content [20]. In comparison with statical websites, social media platforms enable two-way communication between the companies and the consumers. Because most of the content is user-generated, it allows greater involvement and interaction from the end-consumers. This engagement creates a strong relationship between the PTA, the riders, and the new potential riders. These relationships could influence the customer's perception of the brand, generating brand trust and improving the service quality. [22]

On the other hand, social media is the perfect platform to expose bad services from companies. There are plenty of explosive consumer comments on social networks. This content could jeopardize the brand reputation if it is not treated adequately [22]. Therefore, a proper customer service guideline must be developed to protect the company's reputation and to improve the customer's perception of the brand.

2.1.1. Types of Social Media

As mentioned in section 1.2, social media has different types of platforms. The most used types of social media for PTA is listed as follows [15]:

- **Social and Professional Networks:** Social networks use an online platform that allows the users to connect with family, friends and meet new people. Users normally share personal and professional interests, similar activities, or backgrounds. Meanwhile, professional networks are similar to social networks, but the interactions are focused on creating and maintaining professional or business-related connections. PTA use these sites mostly to post information about their services. Examples for these platforms are:
 - **Facebook:** This platform is the largest social network with over 2.6 billion active users in October 2020 [13]. Facebook has two types of profiles: personal profiles and pages of organizations or celebrities. The Facebook home page has a "timeline", where the users are able to share content (e.g. pictures, videos, articles, thoughts, etc.). Personal profiles can create their own networks by sending "friend requests" to other personal profiles, liking pages, and joining groups. Profiles are often private and the content posted is not accessible, unless the profiles are connected. On the other hand, users can "like" organizations or celebrity pages to receive information on the pages on their timeline. Users also have the opportunity of sending private messages to other people or pages.
 - **LinkedIn:** With over 722 million users, LinkedIn is a professional network, where people can find jobs, internships, and connect (the equivalent of a Facebook "friend request" [15]) to other people to improve their professional relationships. Users are encouraged to share their curriculum vitae, work history, and skills. Companies can also use this network to recruit employees for vacant positions and to share their most recent achievements [15].
- **Blogging:** A blog is a website with dated entries, normally presented in reverse chronological order (the most recent posts appear at the top of the website) [23]. They can have a single author, be hosted by different contributors that post and debate about a specific topic, or be hosted by an organization. The content posted normally represents the opinion of the author or the institution and normally they write about a specific subject [23]. A blog must have the following characteristics:
 - Personal editorship.
 - A hyperlinked posting structure to make reference to an external source or to older posts.

- Frequent updates.
- Public access.
- Archived posts so that older content can be easily found. [24]
- **Blogger:** An example of a blogging-website is Blogger.com. This website is a platform where registered users can publish their blogs and people can comment on the publications. Blogs in this platform can include the location of the author by geotagging and post-time stamping at the moment of publication.
- **Microblogging:** Microblogging is a *short* form of blogging. Users can share a smaller amount of sentences, images, or video links in comparison with normal blogs. The content of microblogs does not have to be related and could go from a thought to a specific topic [15].
 - **Twitter:** Twitter has over 340 million users and over 145 million daily active users. This network lets the users share real-time information in form of "tweets". The tweets have a maximum of 280 characters (including spaces) and can include hyperlinks to external websites or media such as photographs and videos. It is also possible to share publications of other users or institutions by "retweeting" the post. Instead of adding a person by sending them a friend request, as on Facebook, on Twitter users simply "follow" people. Some profiles are private, so they require authorization from the user. [15].
- **Media- and Document-Sharing Applications:** This sites allows the registered users to upload photographs, reports, clips, and presentations. Users can leave comments or likes under the media. Unregistered users are only able to watch the media posted by others [15].
 - **YouTube:** YouTube is a media-sharing application. This platform is the second most used social network with over 2 billion users [25]. YouTube is a platform for storing, managing, and broadcasting videos. Only registered users can upload videos, but visitors can search and view the content. Users can save the videos, comment and rate them, and also subscribe to other users. PTAs use this media to educate and inform the citizens about programs and PTA policies. This platform is also used to build support from the community for new projects [15].
 - **Scribd:** This platform is a document-sharing application with more than 100 million users. With a subscription to this social network, the users have unlimited access to magazines, books, audiobooks, and documents. [26]
- **Geolocation Applications:** Geolocation Applications use geographic positioning systems (GPS) from mobile devices to inform users about nearby locations and allow them to share the places they visit.
 - **Foursquare:** Foursquare is a platform where users log to locations they visited. This platform also allows the users to share their location with friends. Foursquare has 3 billion visits monthly. [15]

2.1.2. Social Networks Demographics

After presenting the main characteristics of social networks, it is necessary to explore the demographics of the relevant social networks for this study (Facebook and Twitter). This section includes the age groups of the users of social media, their wages, and their education level.

Social media has users in almost all demographic groups, but most social network users are young adults and students [19]. Figures 2.1 and 2.2 show the users' age of Facebook and Twitter globally. Figure 2.1 shows that almost 56% of Facebook users are between 18 and 34 years old. Only 38% are 35 years or older. Figure 2.2 proves that Twitter's demographics are very similar to those of Facebook, as most users are between 18 and 49 years old.

Besides age, it is worth knowing the income level of people who use social networks. Statistics have shown that people with a higher income (\$75,000 a year or more) and more than a College education tend to use more Twitter and YouTube. On the other hand, Facebook users' salary is lower than \$75,000 per year. Also, most Facebook users have not finished College education [27]. Finally, 64% of urban residents use social networks, while in rural areas only 58% of people use social networks. [28].

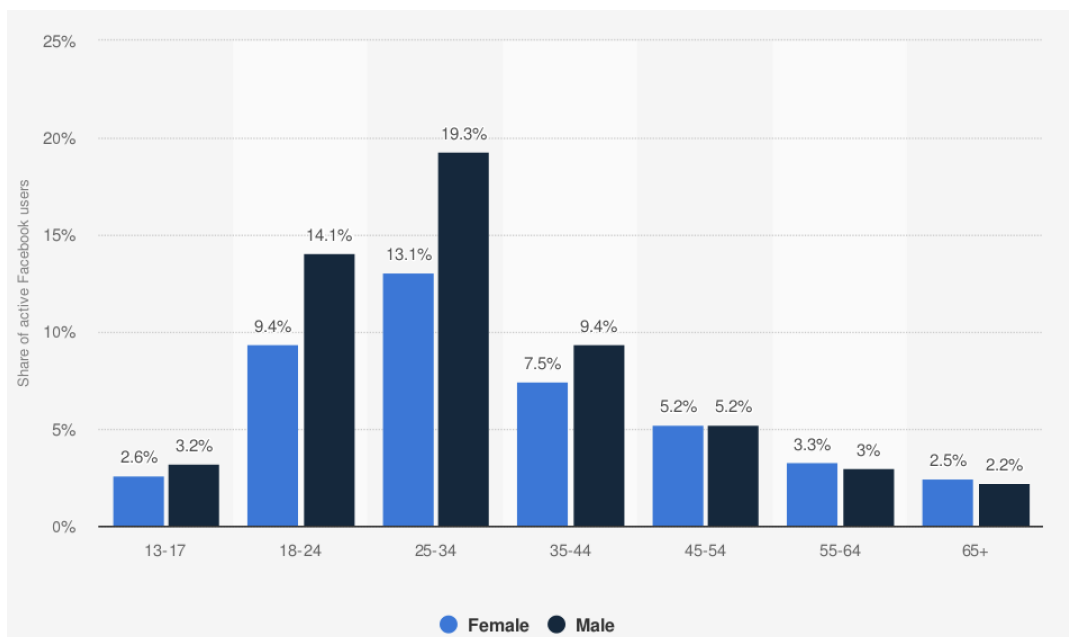


Figure 2.1.: Distribution of Facebook users worldwide as of October 2020, by age and gender. Source: Statista

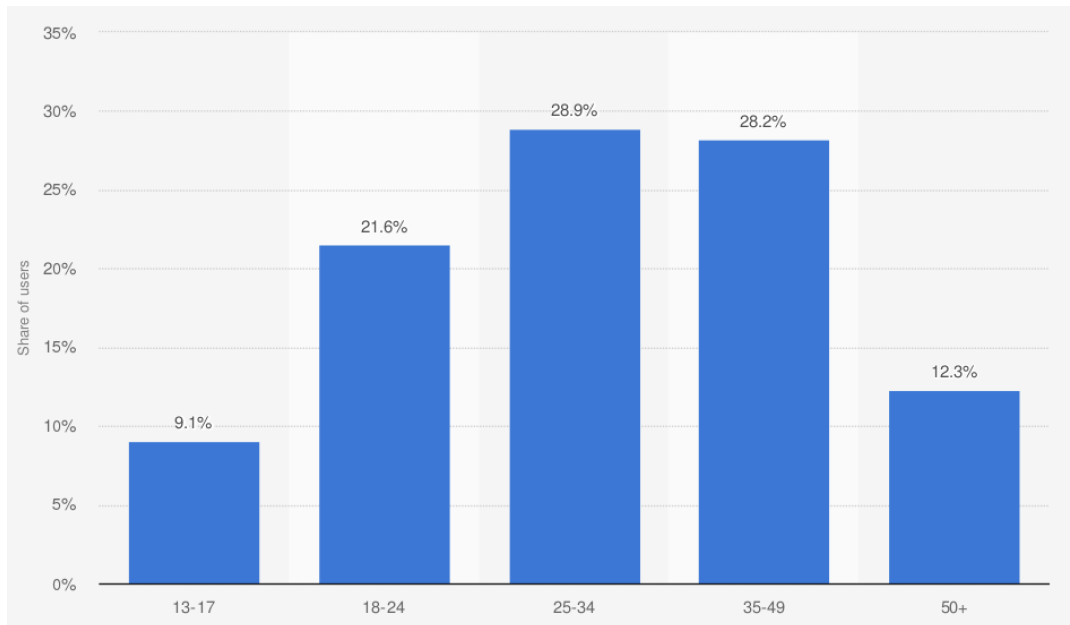


Figure 2.2.: Distribution of Twitter users worldwide as of October 2020, by age group. Source: Statista

2.1.3. Uses of Social Media for public transportation agencies

This section describes for what purposes have PTAs been using the different platforms of social media. The Transit Cooperative Research Program (TCRP) identified five different categories that summarize the use of social networks for PTAs [19]:

- Real-Time service updates.
- General Information.
- Citizen engagement.
- Employee recognition.
- Entertainment.

Besides these five categories, PTAs have been recently using these platforms for marketing, customer services, research, among others. The uses of social networks for PTAs are extensive. Also, as described in section 2.1.1 there are many platforms in which PTAs can share their content. However, PTAs have tried to take advantage of the characteristics of each social network and not adopting a "one-size-fits-all" approach [15]. The different approaches from the PTA are shown on Table 2.1. Table 2.1 shows a survey made on different PTA from North America. Thirty-five PTAs were surveyed. The percentage is based on the number of PTAs that used Facebook, Twitter, or YouTube to publish the different types of information (the same PTA can use all three platforms). The vast majority of PTAs use Twitter to share

real-time updates, due to the platforms' ease of sharing recent information. Twitter offers the option for the users to re-tweet a post or to comment on it. Hence, Twitter is used as an alternative customer service platform and to engage with their followers [15]. Twitter has a private message feature, that allows PTAs to quickly answer questions and feedback.

The next column of Table 2.1 shows that, excluding the real-time updates, Facebook uses for PTA are evenly distributed. Most PTAs use this platform to provide general information about their services and to inform the citizens about new projects, safety guidelines, and different initiatives. Also, PTAs use Facebook to engage with their followers by asking open questions and commenting on the feedback received [15]. Like Twitter, Facebook has a direct message option that allows the PTA to respond to citizens' concerns.

Finally, the last social network on table 2.1 is YouTube. This platform is, in comparison with Facebook and Twitter, the least used. Even though YouTube is the second most used social media, PTAs do not use YouTube as much as other social networks [25]. Therefore, this platform will not be considered in this study. Most PTAs use YouTube to educate and inform the riders about programs, projects, policies, and provide service information. Also, this platform is useful for building support for new initiatives [15].

Platform	Twitter	Facebook	YouTube
PTA News	86%	80%	23%
Real-Time Updates	77%	49%	3%
Promotions	69%	77%	17%
Service Info	63%	69%	20%
Press Release	63%	60%	9%
Other News	57%	63%	14%

Table 2.1.: Uses of Social Media depending on the information. Source: Own Table with information from [19].

After mentioning which social networks PTAs use for which purpose, it is worth stating each objective importance for PTAs. Table 2.2 shows a survey made to 33 different PTAs in North America [19]. They had to rate the importance of each goal on a scale from one to ten. Zero is not important at all and ten being very important. The results of the survey show that most PTAs have similar goals when using social networks. PTAs have a greater interest in communicating with current riders, improving customer satisfaction and PTA image, and reaching for potential new riders. On the other hand, objectives as saving money and recruiting staff are the least important goals for PTAs when using these platforms. Even though PTAs have well-defined objectives, most of the PTAs felt that an improvement of the effectiveness could be made.

Even though there is room for improvement, PTAs noted that using social networks brought

Goal	Average Rate
Communicate with current riders	10.0
Improve Customer Satisfaction	9.5
Improve PTA Image	9.3
Reach for Potential New Riders	9.0
Real-Time Service Updates	8.8
Build Community Support	8.8
Share General Information	8.3
Feedback	8.0
Save Money	6.5
Recruit and Keep Staff	4.8

Table 2.2.: Importance of Social Media for PTAs. Source: Own Table with Information from [19]

several benefits for them. Among the most important are [29]:

- To reach more people and new potential riders
- To have a direct communication with the public
- To generate citizen engagement
- To provide information quickly
- To deliver custom information to target audiences.
- To generate creative solution by taking into account the citizens needs

2.2. Past studies of the uses of social media for public transportation agencies

This section summarizes the most important research made on the uses of social media for PTAs. Studies have been trying to guide PTAs through these platforms to achieve their goals.

Most studies in the area of social networks and PTAs have used similar methods to investigate this topic. PTAs from a single country or region (in most cases the North American region, using PTAs from the United States and Canada) were researched. The authors use surveys [10][19] and/or interviews [19][15] for data collection. Others, have collected the data directly from the social media of the PTAs [30].

The older studies [19] and [15] begin by giving a brief introduction to PTAs' uses of social media. The uses range from real-time service updates, general messaging, citizen engagement, research, and customer service [15]. The authors tried to guide PTAs on how to use social

media in the best way.

Both studies agree that PTAs have to establish social media policies. [15] emphasizes the importance of setting goals, providing roles to the staff in charge of handling these platforms, and addressing legal requirements for public institutions. For the author, it is also important to find the right person(s) to manage social media, the right platform to publish, and the content to publish. Finally, she emphasizes the importance of keeping followers on these platforms, to achieve the objectives. [19] also gave importance to social media policies, since it was found in this study that having a guide for the use of the platforms, and thus being able to calculate more or less the amount of investment needed to keep the platforms active, is key to achieving the objectives set by the PTA. This study emphasized the importance of having a guide to answer the criticisms and feedback received online, as these can be extremely beneficial if taken into account. Finally, the authors discussed the main barriers that PTAs face online, such as criticism, the number of resources they have to employ, and cyber-security.

Aside from social media policies, other studies have investigated the different strategies that PTAs have used and attempted to establish a metric by which PTAs can catalog how effective the strategies have been. The authors of [17] divided the PTAs interviewed by regions within the United States. This step was taken to better understand the different demographic characteristics of social media users and therefore, be able to compare the findings among the different regions by taking into account who used the different platforms. The results showed that the number of followers, user engagement, and positive user perceptions were the most important metrics for PTAs. Meanwhile, the authors of [10] point out that there is no accurate guide to measure the performance of PTAs on social networks. They argue that using only the numbers of followers, likes, retweets, and comments, without performing any deeper analysis, is not enough. Therefore, they propose basing metrics on four key points: *reach, insights, engagement, and efficiency*. Insights measure the community perception towards the PTA. This metric can be carried out with data mining or sentiment analysis. Engagement measures the link from social media to real actions (e.g. increase of the ridership). Efficiency analyzes the benefits from the use of social media and compares it with the investment made in these programs.

Other studies have focused on whether social media can encourage citizen participation. [30] shows that PTAs often use social networks to engage stakeholders and publish public information. Facebook is more used to engage the stakeholders, while on Twitter public information is more common. The research proves that PTAs produce more likes, shares, and comments on Facebook. This type of response can encourage the citizens and cause dialogic communication. On the other hand, PTAs uses Twitter to share timely updates and public information. Finally, the study points out that these platforms have not been completely exploited for various reasons. Firstly, PTAs have not been able to understand the interest of the stakeholders, which causes that PTAs fear innovating in social media. Secondly, due to the "recent" social media boom, PTAs are still learning the best way to manage these platforms.

Problems such as how many staff needs to be delegated to manage social networks or how to respond to comments or online criticism are still unclear for many organizations.

All the studies until now have analyzed the content of the PTAs for a short period. For example, [30] was based on recollecting posts from Facebook and Twitter for only two months, in which 3,837 posts were recollecting. This study, on the other hand, will analyze the content of five different PTAs for three years. Beginning in 2014, then 2017, and finally, 2020. The three-year lapse between the analysis will help determine which strategies were used before, which are still used, and which have changed. More content will be analyzed and the strategies can be sorted into the most successful or unsuccessful based on the interaction obtained. Also, this research innovates by taking into account PTAs from different countries so that more PTAs, with different characteristics, can learn the best strategies on social media for them.

3. Methods

This chapter presents the methods for this study. Initially, how the data from the social networks was collected and analyzed is presented. Then, the interview procedure is explained. Finally, a summary of the PTAs analyzed and how the methods were applied to each one is described.

3.1. Methods

The first section of this chapter describes the approach used to recollect the data and analyze the results. Also, the structure of the interviews is described in this part.

3.2. Data Analysis and Topic Clustering

Social media allows the dissemination of all types of information (e.g. entertainment, politics, business) at low cost and ubiquitously [31]. The growth of these platforms is inevitable [12]. Hence, the information posted online has also been growing. All the data posted on social networks is called Social Media Big Data [31]. By analyzing this data, researchers gain insights into marketing strategies, trends, influential actors, and many other categories [31]. Therefore, data analysis is a vital step to conduct a research, specially when working with social media.

3.2.1. Data Analysis

Firstly, to define how data analysis must be carried out, it is necessary to explain what does data means. Data is defined as random information that makes a statement about a system [32]. In social networks, the data could be textual content, pictures, videos, sounds, among other information concerning the user and his connections.

Data analysis is always carried out to answer a particular question and is divided into the four different levels showed in Figure 3.1 [32]. The first step is to perform frequency analysis. By eliminating unnecessary information, the analysis gain reliability, and precision. The second level consists of pattern recognition. Here the data is grouped and structured, without a mathematical model. On the third level, quantitative data analysis is carried out. Here, the functional relations between the data should be recognized and specified if necessary. Finally, in the fourth step conclusions and evaluations are made.

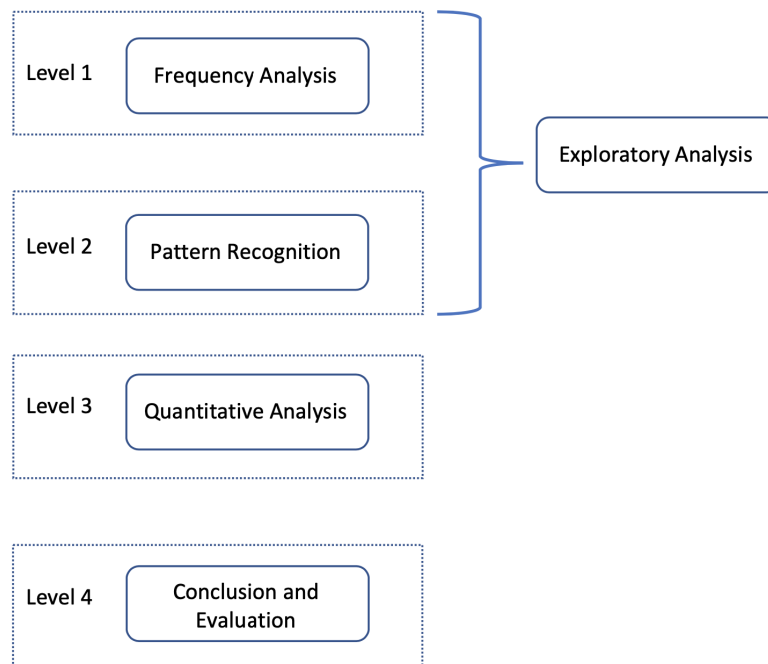


Figure 3.1.: Levels of Data Analysis. Source: Own Figure

Within the data analysis, there are two methods worth highlighting. Those are qualitative data analysis and quantitative data analysis. Qualitative data analysis takes place in the second step (pattern recognition) [32]. On this level, the aim is to group the data based on their similarity. This analysis is based on the attributes and properties of the data, which can not be computed or represented by a numerical statistic [33]. In contrast, the quantitative data analysis (level three) builds functional relations between the data. This type of data analysis can be quantified and expressed numerically [33].

3.2.2. Topic Clustering

To analyze a large data set, it is useful to classify data into more convenient groups so that the data can be understood and retrieved more quickly and efficiently [34]. To each group, a label has to be assigned. This label has to summarize the information of the group, show the similarities and differences among the data and the other groups [34]. Therefore, topic clustering aims to generate groups with the following characteristics [32]:

- **Homogeneity** among the same cluster. Data that belongs to a same cluster should be as similar as possible.
- **Heterogeneity** between different clusters. The data of different clusters should be as

different as possible.

How the similarity is defined, depends on the content of the data analyzed. For real-valued vectors, the Euclidean distance can be used as a scale for dissimilarity. For abstract classes (e.g. types of social networks) numbers can be assigned. Nevertheless, assumptions must be made. For example, that social media X, which was assigned with the number one, is more similar to social media Y, with the number five. [32]

There are numerous techniques for clustering. Among the most common are:

- **Deterministic crisp cluster analysis techniques:** Each data is assigned to exactly one cluster [32].
- **Overlapping crisp cluster analysis techniques:** Each data will be assigned to *at least* one cluster. With this technique a data can be assigned to several clusters [32].
- **Hierarchical cluster analysis techniques:** Here, data will be partitioned that may be from a single cluster containing all the data, to n clusters each containing a single data [34].

3.2.3. Word Cloud

After realizing the clustering, a visualization of the results is very useful to begin with the analysis. Word clouds help the viewer see the most important tags of a text and therefore, make it easier to perform a deeper analysis of the text [35]. A word cloud is a useful tool to provide a statistical overview of a text. Their main use is to provide a visually appealing summary of a text [35]. This representation allows the viewer to become aware of the topics, and the frequency of the topics, on a text. The frequency of a topic is displayed with the font size. The bigger the font size of a word is, the more often this word appears on the text. Also, the properties of the text (size and color) attract the user's attention more easily.

3.2.4. Social media: data collection and analysis

The study is divided into two parts. The first part analyzes the social networks of the PTAs. The second part is the interviews, which are explained in detail in section 3.2.5. An explanatory mixed-method approach is carried out for this study. A mixed-method approach combines the quantitative and qualitative data analysis to combine the advantages of each method and to try to counteract their disadvantages. Therefore, a mixed-method approach provides more insights into the study.

Figure 3.2 displays the main structure of the explanatory mixed-method approach. The image shows that this approach has two parts. The first one, in this case, the social media content analysis, builds the structure of the second part, the interviews. The social media content analysis generates the information needed to select the interview participants and

choose the topics of the interviews.

For the first part of the study, five different PTAs were selected: Münchner Verkehrsgesellschaft (MVG) from Germany, Instituto Costarricense de Ferrocarriles (INCOFER) from Costa Rica, Tranvia de Tenerife from the Canary Islands, Metro Madrid from Spain, and Tranvia de Cuenca from Ecuador. The goal of this selection is to have PTAs from different regions of the world and countries with different characteristics. This allows a better understanding of whether the strategies used vary according to the characteristics of each country or whether all PTAs should use the same strategies.

This study focuses on Twitter and Facebook from the PTAs. These platforms were chosen because they are the most used ones. Facebook is the most used social media in the world (until 2021) [25]. Meanwhile, Twitter is the most used social network among PTAs [10].

The content of Facebook and Twitter is collected with the same method. When a PTA publishes more than 200 posts per month, 15% of the posts are collected. Otherwise, 30% of the monthly posts are collected. These limits keep the number of posts collected evenly balanced so that the number of monthly posts does not affect the analysis of the content.

Each PTA and each social network is to be analyzed separately. The recollection of the content is random, allowing to select not only the most popular content but also all posts that did not receive as many likes, comments, or retweets. To ensure that the content collected is not affected by any major event or popular activity, the following structure is to be followed. First, depending on the monthly number of posts, it is calculated how much content has to be collected for that month. Then, each month is divided into three equal parts. For each of these parts, every fifth post is recollected and transcribed to a database with the date, the platform from which it was obtained, and the number of likes, comments, and retweets/shares. The second part of the month begins once a third of the calculated monthly posts is collected. This procedure is followed until the number of posts for that month is completed.

Once the posts' information is in the database, each post is classified separately. To each post, a category is assigned. [15] produced a list of the seven most used categories by PTAs on social networks. The list includes real-time updates, public information, citizen engagement, marketing, research, customer service, and entertainment. In order to understand better the topics discussed in social networks, in addition to these seven categories, each post is assigned one or more tags. These tags try to synthesize the subtopics discussed in each post. The list of tags can be wide, but some common ones are accidents, damages, climate change, and corona-virus.

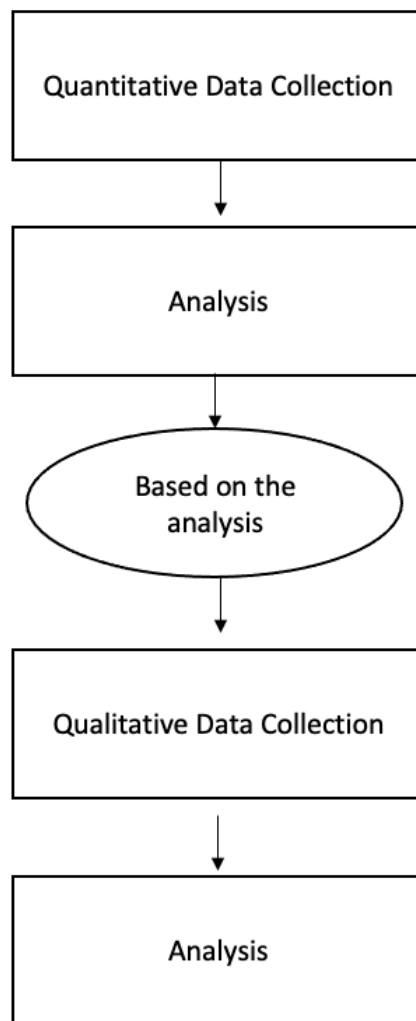


Figure 3.2.: Explanatory mixed methods approach. Source: Own Figure

Each post is quantified based on a five-point scale. This scale measures the engagement content received. Zero points are given when the content did not generate any interaction. Meanwhile, five points are given to the interactions that bring the most benefits for the PTAs. Therefore, three factors are taken into account:

1. **Shares/Retweets:** When content is shared/retweeted it helps the post reach more people, generating more conversations and discussions. In most cases, it also means that they agree with the content of the post. Therefore, each share and retweet receive five points.
2. **Comments:** Whenever a post receives a comment, it provides an opportunity for it to be replied to by the PTA. In this way, a conversation or discussion can take place, which provides an opening for the PTA to present their arguments and persuade or improve the citizen's opinion about the issue. However, not all comments are positive, and not all generate a conversation. Therefore, for each comment four points are given.
3. **Likes:** Likes do not generate any conversation, engagement nor advertising. Therefore, each like receives one point.

Once each post has been quantified with the interaction scale, the results for each PTA are analyzed. The first step is to compare the number of monthly publications with the number of interactions received. Each year is analyzed separately. Then, for each social network and each PTA, a word-cloud is made. The word-cloud visualizes, in a quick and easy way, the most common words and tags used on each social network. A comparison of the most common subtopics, divided by year and social network is made. Finally, a list of the five posts that obtained the most interactions, per year and social media, is made. By taking into account only the five posts with the most interactions, it is ensured to differentiate between the most frequent content and the most interacted content.

The data collection and its analysis will illustrate the strategies used by each PTA in the different social networks and through the different years. It will exemplify whether a one-size-fits-all strategy was used or if the content of each social network changes. Also, it shows which topics generate the most interactions from the public.

3.2.5. Interviews

Interviews will be carried out to validate the data recollected from social media and gain insights from their usage. Interviews are verbal exchanges in which the interviewer tries to obtain information from the interviewee. The interviewer is normally interested in gaining insights into opinions, attitudes, experiences, processes, or just collect facts about a topic. Interviews can be made to just one person at a time (individual interview) or with a group of people (focus group). [36]

Among this type of data collection, there are different types of interviews. The first one is the structured interviews. Here, the interviewer asks a few questions and, normally, the interviewee responds with a short answer. The same questions are asked to every interviewee, which makes it easier for the researcher to compare the answers among the interviewees. This type of interview is very similar to a questionnaire, with the difference that the interviewee does not know what the following question will be. This characteristic makes structured interviews have a higher response rate than questionnaires. [36]

On the other hand, unstructured interviews are more spontaneous. Here, there are fewer topics to be discussed with the goal that the interviewee can elaborate more about the issue. As the interviewee talks, the interviewer may vary the questions to go following the line of conversation. Because of the different paths in which an interview may go with this technique, interviews are harder to compare. [36]

The last, and most common, technique is the semi-structured interview. This technique is a combination of structured and unstructured interviews. The interviewer asks questions. For each question, there are also between two to four sub-questions, in case that the interviewee does not elaborate on the path that the interviewer wants. This type of interview traces a path for the conversation but also allows more flexibility.

An interview has a similar dynamic as a normal conversation. Therefore, for a successful interview, both parties have to remain engaged. For this to happen, especially in a semi-structured interview, the interviewer has to ask an initial question that encourages the respondent to talk freely. Then, the next intervention by the researcher will be given by the interviewee's answer. The first response of the interviewee is normally superficial. The follow-up questions achieve a deeper understanding of the participant's opinion.

Interviews have stages that can help the researcher direct the conversation as they wish. The stages are the following [37]:

1. **Introducing the research:** On this step the interview officially begins. The researcher must redirect the interactions by introducing the research topic. The interviewer must state the purpose of the research and the interview.
2. **Beginning the interview:** After introducing the topic, the interviewer must ask a question. The opening question can be an open question that allows the interviewee to talk freely and gain confidence. On the other hand, the interviewer can gain important contextual information from this question.
3. **During the interview:** The researcher must take control of the path that the interview is following. The conversation threads must be always guided by the interviewer, so that all the topics are explored.
4. **Ending the interview:** Here, it is intended for the researcher to review if all the topics

were answered. This step is also useful for the interviewee to wrap all the topics with a conclusion.

After conducting the interviews, they should be analyzed. Each type of interview has its proceeding. For structured interviews, the analysis is very similar to the quantitative data analysis explained in section 3.2.1. This interview type has the same questions for all the interviewees. Therefore, the answers can be grouped easily. Once the answers are grouped, the data can be quantified numerically, which allows the interviewer to search for statistical patterns among the responses.

The first step to analyze the unstructured or semi-structured interviews is to transcribe the interview. The recorded interview has to be transformed into a written text. Once the transcripts are finished, the researcher must annotate the non-verbal behaviors [38]. After reading again the transcripts, the interviewer has to begin coding the text. For each paragraph, the interviewer has to assign a code. The code has to summarize the ideas told by the interviewee. The code can be a noun or a verb. There are two steps to code a text. The first one is open coding. Here, the interviewer makes annotations line by line of the transcripts. For this step, it is vital not to associate the answers with the questions because it can deviate the attention of the researcher by coding what he expects to find. Keeping an open mind is vital for the first stage. The second step is focused coding. The codes found on the first step are combined and narrowed down. Here, related categories are combined. Finally, for each group of codes, a name (or code) has to be given. [38]

The second part of the study consists of analyzing five interviews with different experts on the subject. Three of the interviews were carried out with experts from INCOFER Costa Rica, Tranvia de Cuenca, and Tranvia de Tenerife. For each interview, a focus group was gathered. The idea is to have different persons, with different expertise. The person in charge of the social networks describes how these platforms are being used. Meanwhile, the other people participating give their opinion of this use and possible areas for improvement. As well as the uses of social networks to plan their transportation services. Thus, what is being done by PTAs and opinions on what can be improved are collected. By showing them the results obtained from the data collection and analysis, the experts are going to validate the data obtained and give more insights on the current uses of social networks for PTAs.

The interviews for this study will be conducted in a semi-structured way. This structure allows the interviewer to discuss the topics that he considers of interest. For each topic, follow-up questions are made. Depending on the answers, the interviewer can choose the most meaningful path to cover.

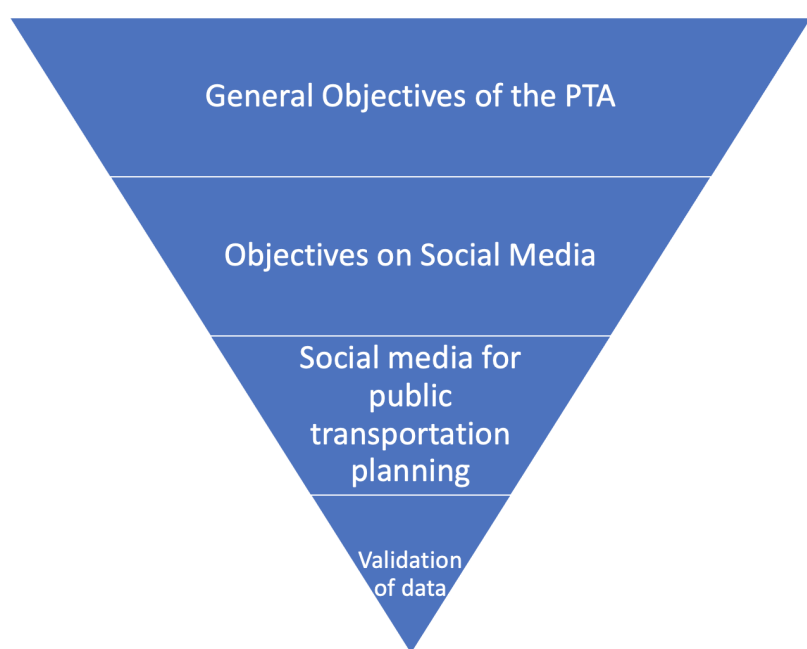


Figure 3.3.: Flowchart of the Interview. Source: Own Graph

Figure 3.3 shows the main structure of the interviews. There are four main topics to discuss in the interviews. They start with a general topic and the main objectives of the PTA. The main reasons for the PTA to operate and how are they helping the city by operating is asked.

On the second level, the main goals of using social media are asked. A comparison between the general goals of the PTA and the specific goals for social media is carried out. Thus, it becomes clear if there the general goals of the PTA are the same goals they want to achieve by using social media. Then, participants are requested to provide an explanation of the approaches used to meet these objectives. It is also questioned whether a specific social network is used for the different objectives or whether both platforms work equally well to meet the different goals.

The third step covers how are PTAs using social media to improve their transportation services and innovating their public transport planning. The interviewees are asked how they are addressing the feedback received. How they prioritize among all the comments and if they have created a database with the complaints to recognize which are the most frequent ones in order to improve the service. Also, the ways in which the PTA uses social media to plan public transportation are asked. Emphasis is placed on whether the public transportation planning takes into account trending topics or popular activities in social networks. The feedback obtained on social media is a key aspect for the planning and improvement of the public transportation network.

The fourth level is for data validation. The most important information, such as the sub-themes frequencies and the sub-themes with more interactions are presented. Each information is divided by the social network and through the years. The interviewees are asked if they notice important information missing (due to the randomness of post-selection used) or if they have any remarks. If there are any changes on the subtopics throughout the years or if a specific topic is only discussed in one platform, they are asked for a brief explanation. Finally, the experts are asked for some recommendations if they had to advise another PTA to benefit from the uses of social media.

3.3. Application to each public transportation agency

This section contains a description of the different PTAs. It also explains how the methods were applied to each city.

3.3.1. Tranvia de Tenerife

Tenerife is an island in the Canary Islands. The whole region of the Canary Islands has a gross domestic product of nearly 47 million euros [39]. Tranvia de Tenerife has two lines in service in the metropolitan area of Tenerife. The two lines together have a length of 15,1 km. The lines run between the cities of Santa Cruz and La Laguna. The tramway provides service to 400.000 people on the island and they have around 60.000 daily passengers. Service is provided daily. On weekdays the service is from 6:00 am to 24:00. On weekends the service is provided all day.

Facebook was the first used social network in 2009. After growing in this platform, in 2011 they decided to join Twitter. For both platforms, 30% of the monthly posts were collected. Every post was assigned a category and given one or more tags to describe the content.

For the interview with Tranvia de Tenerife, a focus group was gathered. Three different persons, with different tasks and responsibilities within the PTA participated. Therefore, the experts presented their answers according to the topic to be discussed. In this case, social networks and public transportation planning.

3.3.2. Instituto Costarricense de Ferrocarriles

INCOFER operates in Costa Rica. Costa Rica has a gross domestic product of around 55 million euros [39]. This state-owned public railroad company connects the provinces of Alajuela, Heredia, San Jose, and Cartago (the four main provinces from Costa Rica) with its service. The length of the INCOFER interurban train is 72 km. As it is known today, the intercity train service began operating in 2005. The service is given from Mondays to Fridays from 5:00 to 8:00 and in the evenings from 15:30 to 19:00. Saturdays the schedule is from 5:00 am to 14:00.

INCOFER started using social media in 2013. Although the oldest posts are from April 2014. For this PTA, 30% of the monthly Facebook and Twitter posts were recollected. To each post, a category was assigned and tags were chosen to synthesize the content of each post.

Based on the results, the interview was built up. A focus group was gathered to participate in the interview. Both persons work for the INCOFER but in different departments. One is in charge of the PTA's social media. The other one participates in different departments of the institution.

3.3.3. Tranvia de Cuenca

Cuenca is a city in Ecuador. Ecuador has a gross domestic product of almost 96 million euros [39]. Tranvia de Cuenca is the only tram of Ecuador and the most modern public transportation service in Cuenca. It has a length of 20,4 km. They provide around 120.000 daily trips. The service is provided every day from 6:00 to 21:00.

They started using Facebook and Twitter in mid-2014. The construction of the tramway started in December 2013 and was totally concluded until 2018. Therefore, the use of their social platforms in 2014 was mainly to inform about the construction of the tram. For Twitter, 15% of the monthly posts were recollected. Meanwhile, for Facebook 30% of the posts were recollected.

In the case of Cuenca, only one person was interviewed. The person in charge of conducting the interview was the director of the PTA. She gave her opinion, as a civil engineer focused on urban mobility, on how the Tramway benefited from the use of social networks.

3.3.4. Münchner Verkehrsgesellschaft

The city of Munich has almost 1,56 million inhabitants. Munich has a gross domestic product of 115 million euros [39]. The MVG is a municipally-owned PTA. They are in charge of operating the buses, tramways, and metro-lines in the city of Munich. The service of the MVG covers an area of 449 km^2 . They offer also car-sharing and bike-sharing as part of their mobility options. They operate 24 hours a day on a daily basis.

MVG started using Twitter in 2010. But this page was abandoned in 2013. The current MVG Twitter profile was created in 2012. The Facebook page was created in 2011. For this PTA 15% of the Twitter posts were recollected. For Facebook, 30% of the posts were taken into account.

Attempts were made to contact different people in the company for an interview, but none of them were available.

3.3.5. Metro de Madrid

Madrid has 3,2 million inhabitants. This city has a gross domestic product of 240 million euros [39]. The Metro de Madrid subway network was inaugurated in 1919 and is the third more extensive metro in Europe, with a length of 294 km. Metro de Madrid offers only subway service within the mobility options. They provide service on a daily basis from 06:00 until 01:30.

Metro de Madrid started using Twitter in 2010. Their Facebook page was also created in 2010. For this PTA, 15% of the monthly Twitter posts were recollected. Meanwhile, for Facebook, 30% of the monthly posts were recollected.

Attempts were made to contact different people in the company for an interview, but none of them were available.

4. Results

Chapter 4 contains a description of the results obtained from the data collection and the interviews. This chapter is divided into six sections. The first section includes general information about each PTA, followed by five sections of their results.

First, the analyzed PTAs are going to be compared regarding the activity on their social media and the interactions they received. Figure 4.1 shows the average of monthly posts versus the average of interactions obtained. In blue are the Twitter posts and in orange the Facebook posts. Each year has its mark. Therefore, for each PTA is represented by six marks. Three are for Twitter and three are for Facebook.

There are three clusters in this graph. Cluster 1 is on the left top corner. This cluster contains only posts from Facebook from the INCOFER, MVG, Metro de Madrid, and Tranvia de Tenerife. The content of this cluster is from the years (2017 and 2020). With a monthly activity ranging between 17 and 35, this cluster obtained the most interactions. The average of interactions is between 428 and 710.

The second cluster is on the left bottom of the graph. This cluster is a mix of both social networks. This group contains the INCOFER and Tranvia de Tenerife Twitter. Also, the 2014 Twitter content of Tranvia de Cuenca is in this cluster. On the other hand, Tranvia de Cuenca's Facebook postings are located in this cluster. The MVG Facebook has two years in this cluster (2014 and 2017). Tranvia de Tenerife has also two years in this cluster, 2014 and 2017. The difference between the interactions obtained by the PTA in these years is almost nonexistent. Finally, the Facebook content of INCOFER and Metro de Madrid have the year 2014 in this cluster. The number of monthly posts ranges between 10 and 53. The interactions for this cluster lie between five and 290. In most cases, Facebook posts obtained more interactions than Twitter posts.

Cluster 3, on the right bottom, shows the Twitter posts of the MVG, Metro Madrid, and two years (2017 and 2020) of Tranvia de Cuenca's Twitter. The main characteristic of this cluster is to have a high number of monthly posts (average of 200 posts per month) and an interaction lower than 106. It is worth remarking, that Metro Madrid uses its Twitter account for customer service. Customer service posts do not obtain as many interactions as regular posts because, usually, they are answering a concern for just one person.

4. Results

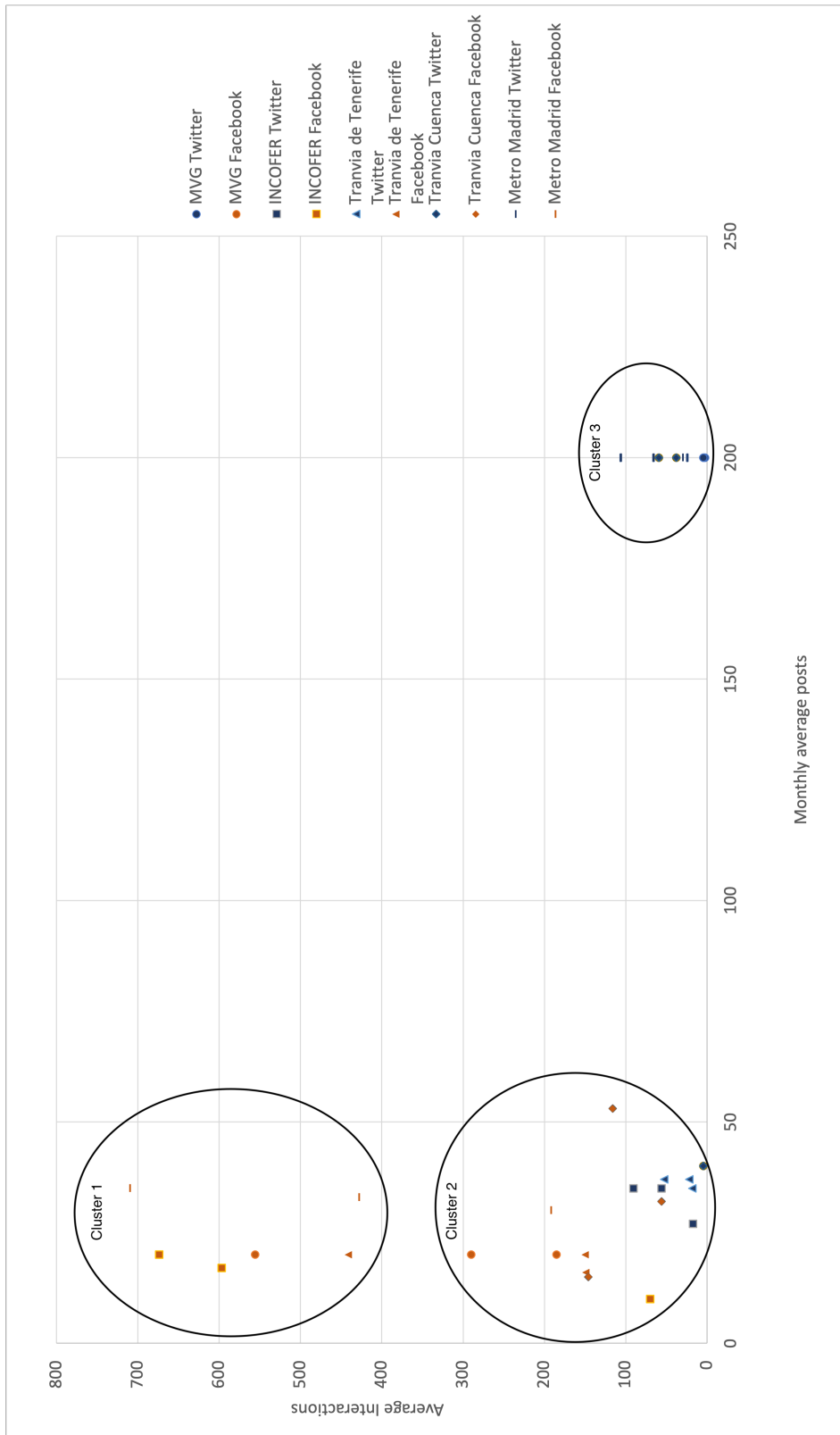


Figure 4.1.: Tranvia de Tenerife topic frequency. Source: Own Figure

Figure 4.1 shows that PTAs who posted less on social networks usually got higher interactions from the riders. These results could be affected by the fact that some of them used Twitter for providing fast customer service, which can alter the interactions obtained. It is to emphasize that the interactions grew as the years went by for all five PTAs. In 2014, the PTAs obtained the least amount of interactions, while in 2020 the most.

The following five subsections present the results of the five PTAs in detail.

4.1. Tranvia de Tenerife

Tranvia de Tenerife operates on the north of the island and provides its services to nearly 400,000 citizens, with a daily demand of 60,000 thousand passengers. For Tenerife 30% of the Facebook and Twitter posts were recollected for the years 2014, 2017, and 2020. Figure 4.2 shows the most common words used in this platform and the most common tags. Twitter was used to share public information such as activities, schedules, and customer service for any questions from users. Most of the questions or complaints were about schedules, frequencies, or malfunctioning of a unit. This platform is also used for real-time updates of the services offered. Twitter was the most used social media to report damages, changes in schedules and frequencies, and accidents. Most of the public information was reinforced with a photograph or a video. In contrast, customer services and real-time updates had no media attached.

On the other hand, Figure 4.3 shows the most frequent words and tags that were used on Tranvia de Tenerife's Facebook page. Facebook was mainly used to publish public information. Topics such as activities, schedules, frequencies, and the operation of different stations were common on this platform. Like Twitter, Facebook was used to report real-time updates. Although this type of information was published less frequently on this platform. Finally, Facebook was used to post job vacancies and attempt to recruit new personnel.

Based on the word-clouds of this PTA, posts on Twitter handle more topics than Facebook. Figure 4.8 reaffirm this statement. The figure shows the topic frequency posted on Twitter and Facebook. The figure shows how the most frequently posted categories (activities, customer service, and schedules) have been constant over the years and across social networks. Both activities and schedules were posted on both social networks equally. Meanwhile, customer service was, for all 3 years, posted on Twitter. The most frequent category was activities. Tranvia de Tenerife took advantage of activities such as the Tenerife Carnival, the arrival of the Three Kings, soccer and basketball games, as well as different concerts, to encourage citizens to use public transport. Even, to promote the Tramway, it was arranged for the Three Kings to arrive in the city using the Tramway of Tenerife. Then, Twitter was the only platform to answer people's doubts and concerns. The schedules of the services offered were

4. Results

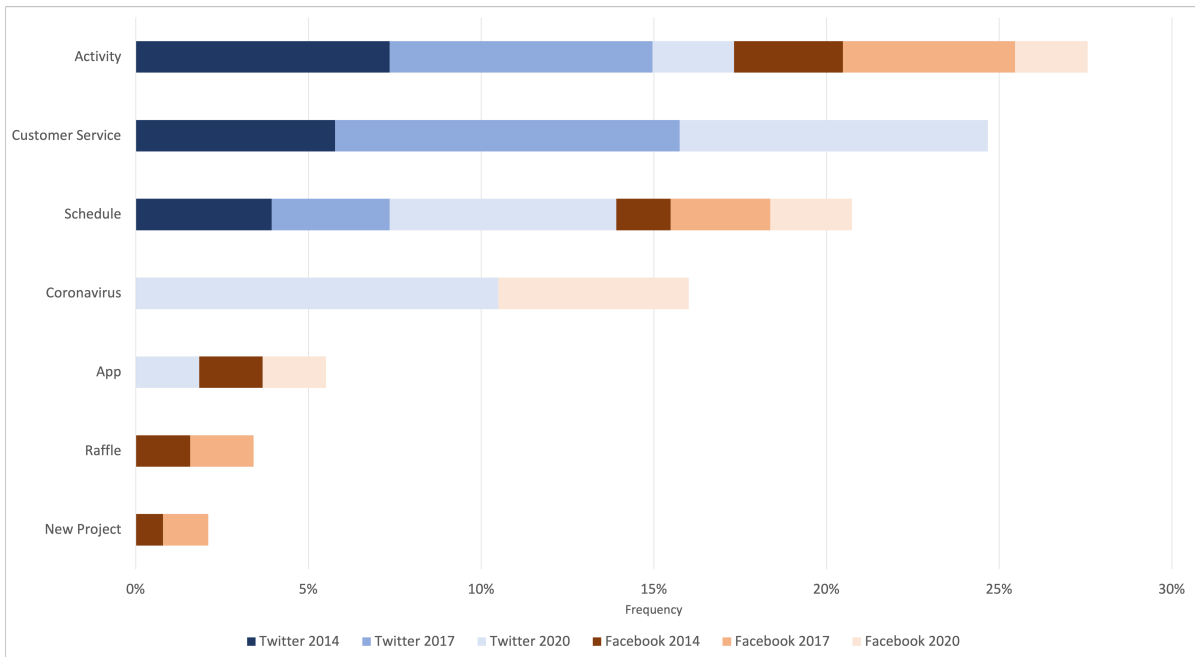


Figure 4.4.: Tranvia de Tenerife topic frequency. Source: Own Figure

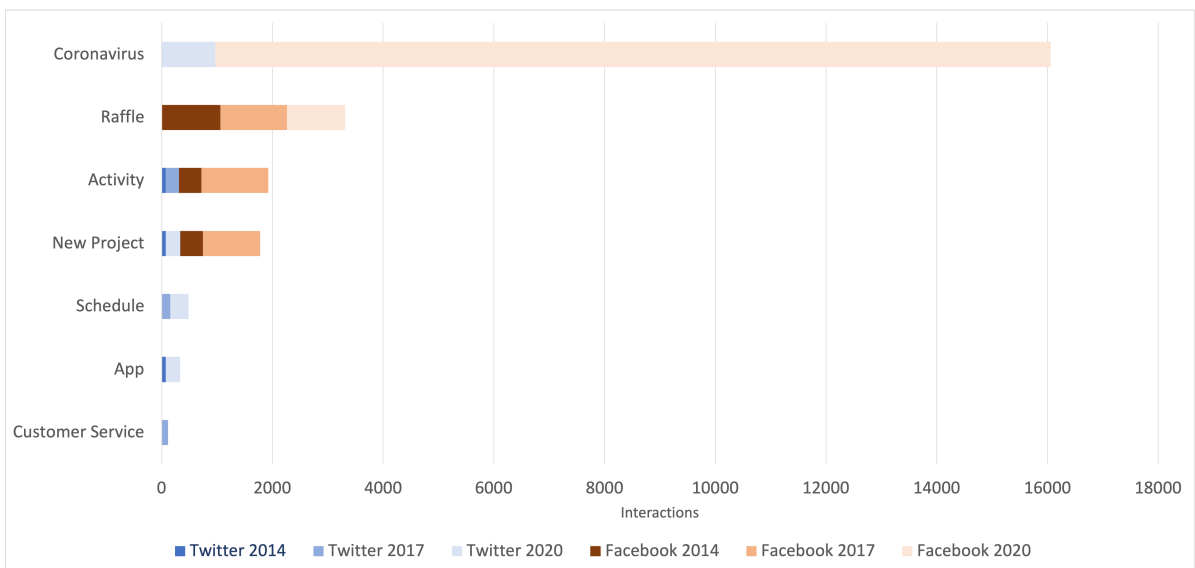


Figure 4.5.: Tranvia de Tenerife topic interactions. Source: Own Figure

Post	Category
Tonight at #carnavalsc just worry about the "little step, tuntun ...". We are here to take you and bring you :-)	Activity
@danisenses uncivil attitudes are punishable by our reviewers ... although it is a real shame that it has to come to that	Customer Service
Do you already know the hours of the Tram at Carnival? ... From today you have them at all our stops. Happy Carnival!	Schedule and activity
The daily cleaning of the trams will also be expanded with the disinfection of both the driver's cabin and the passenger lounge of all units.	Coronavirus
Do you still have doubts about how ten + mobile works, your app to travel on TITSA and the Tenerife Tram? ...	App
Today we want to start the day with strength and for this there is nothing better than to give our travelers tickets for this wonderful show, which will be on November 27 at 8:30 p.m. at the	Raffle
We have a new bicycle parking at the Trinidad stop! ...	New Project

Table 4.1.: Example of the topics posted by Tranvia de Tenerife. Source: Posts from Facebook and Twitter of Tranvia de Tenerife

4.1.1. Interview

The interview with Tranvia de Tenerife was carried out after the data recollection. The interview followed the structure explained in section 3.2.5. It started by asking the experts from the marketing and planning department about the main general goals of the company. They explained that the PTA has three different objectives: 1) to provide an efficient public transport option for the people in Tenerife, 2) to plan a railway network connecting the entire island from north to south, and 3) to export knowledge.

The second question was if these goals of the company were the same goals they had when using social media. They divided these objectives into four parts:

1. to have a quick and efficient customer service platform to combine with the physical stores and with the customer service via telephone
2. to provide general information to their followers, whenever there is a schedule change, a new project, new fares, etc.

3. to encourage people to use public transportation and, therefore, to attract more clients.
4. to provide institutional information. In this category, they inform about the different goals of the company.

Each objective adapts better to social media. Tranvia de Tenerife uses their Facebook "to explain things in detail, [since] it allows writing more". According to the social media manager, users of the two platforms behave differently. Facebook users are not "as hooked on social networks". If the PTA answers a comment or a complaint on Facebook three or four hours later, the followers will still be thankful to receive an answer. Meanwhile, on Twitter, people expect answers immediately. Therefore, "customer service is channeled almost entirely through Twitter". Also, Twitter has the limitation of characters. Even though threads can be made, posts that require extensive explanations are not posted on this platform.

Each platform has obstacles that can either benefit or harm the PTA. Twitter has the limitation of characters, which does not allow the PTA to explain in detail each publication. Facebook has a Facebook algorithm, that only shows interesting content to the persons. To overcome this obstacle, Tranvia de Tenerife raffles tickets to different activities. This content usually generates plenty of interactions, that allow the follow-up posts to reach more people. They also try to restrict the number of posts made to one or three daily posts, to focus on certain topics and not generate spam.

Tranvia de Tenerife focuses a lot of attention on people's feedback. Even though they read all the messages and posts directed to them on Twitter and Facebook, they prioritize the private messages because people that write them in private usually want their problem to be solved and the service to improve. Meanwhile, public messages are separated between those containing insults, exaggerated terms, and derogatory terms, and the messages that contain normal doubts and complaints. The first group of messages is normally ignored. The second group usually receives an answer from the PTA. The different complaints recollectored from social networks, the physical shops, and via telephone are recollectored and a record of all the complaints is kept. Each complaint is sent to the different department of the PTA (i.e. if a station is dirty the complaint is sent to the maintenance and cleaning department). This way each department can keep a record of the most common complaints and the people in charge of social media can respond with an accurate solution to the problem.

Another important matter treated in the interviews was if the PTA takes into account trending topics of the different social networks to plan their services. Tranvia de Tenerife does not use social networks for this purpose. Instead, they keep a record of the most popular events and locations. This way, and based merely on experiences from past years, they plan their services. The PTA tried to include sites of interest and shops near the different stations to attract people to move with public transport.

The last level of the interview was to validate the data recollectored. Figure 4.4 shows that customer service was offered only on Twitter. Respondents reported that "30-40 messages

from different people are received privately every day" on Facebook Messenger. They also did not take into account the private messages sent on Twitter, which are six or seven per day. It was asked why new projects were only published on Facebook and the answer was that "new projects require a detailed explanation. Twitter does not allow that possibility, a link can be posted. But a new project requires an explanatory text, this is offered by Facebook". It was also asked about the raffles. The purpose of these is mere that the Facebook profile benefits from Facebook's algorithm. Finally, he asked about the interactions generated by the schedules on Twitter. The answer was that "people look to Twitter for quick answers".

The last question to the experts was to make a recommendation to other PTAs with similar characteristics for the use of social media. They gave two recommendations. The first one is not to use social networks as a "bulletin board". Social networks have to generate intercommunication with people, you have to talk to your followers. Otherwise, the social network becomes merely a table of advertisements of no importance. The second one is to pay attention to the comments of the users, without allowing the users to dictate the way forward. A group of people can make a lot of noise regarding an issue. If the PTA pleases this group of people, a larger percentage of the citizens could be affected by this decision.

4.2. Instituto Costarricense de Ferrocarriles

This section presents the results of the data recollection and the interview carried out with the persons responsible for the social networks of the INCOFER. For this PTA 30% of the monthly Facebook and Twitter posts were recollected for the years 2014, 2017, and 2020. Facebook and Twitter were used in a very similar way. Figure 4.6 shows the most common words and tags used on Twitter by the INCOFER. Most of the publications were public information concerning schedules, repairs, and new projects. They also created different campaigns to educate the citizens on how to safely coexist with the train. INCOFER also used Twitter to give real-time updates to the riders. Schedule deviations, suspended services, and "UH" (meaning last minute) information were the most common words in this category. Lastly, they provided on Twitter customer service.

Figure 4.7 shows the most common words and tags used by the INCOFER on Facebook. This figure displays the similarities in the uses between Twitter and Facebook. The most common content was public information. Words like "schedules", "maintenance", "new projects", and "fares" show the type of general information published. The same education campaign posted on Twitter was posted on Facebook. Real-time updates were posted on Facebook as well. Schedule deviations, confirmation of trains, and accidents were the most common issues. The content of Facebook is normally accompanied by multimedia. The main difference between Facebook and Twitter uses is the customer service. Facebook was not used as a customer service platform. Instead, all efforts were focused on Twitter for this issue.



Figure 4.6.: Word-Cloud of the INCOFER's Twitter. Source: Own Figure

Figure 4.8 shows in detail which topics were most frequent on Twitter and Facebook. The most common category was new projects. This information was published during 2014, 2017, and 2020 on Facebook. Meanwhile, these projects started to be published on Twitter from 2017 on-wards. The figure shows how over the years this information became more and more frequent. The second most frequent issue was the publication of schedules. Both platforms were used equally during the three years analyzed. The "other" category includes different topics that, on their own, were infrequent. For example, content appealing for institutional transparency or photographs of the president of Costa Rica using public transportation. This content was published in 2014 on both platforms. In 2017, priority was given to Facebook, while in 2020 it was mostly published on Twitter. The fourth bar shows the topic of climate change. Especially during 2020, INCOFER published content that positioned them as an PTA that cares about reducing greenhouse gases. Within this category is the purchase of electric trains or content about new projects that are more environmentally friendly. Both Facebook

4. Results

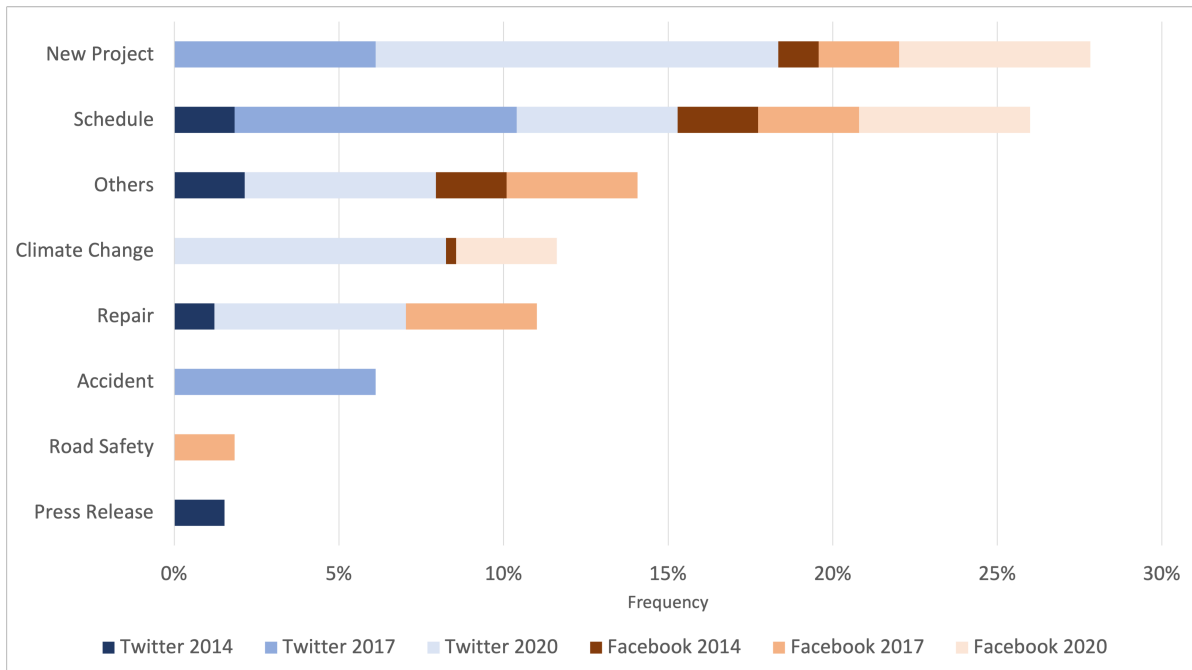


Figure 4.8.: INCOFER topic frequency. Source: Own Figure

releases were more successful on Twitter.

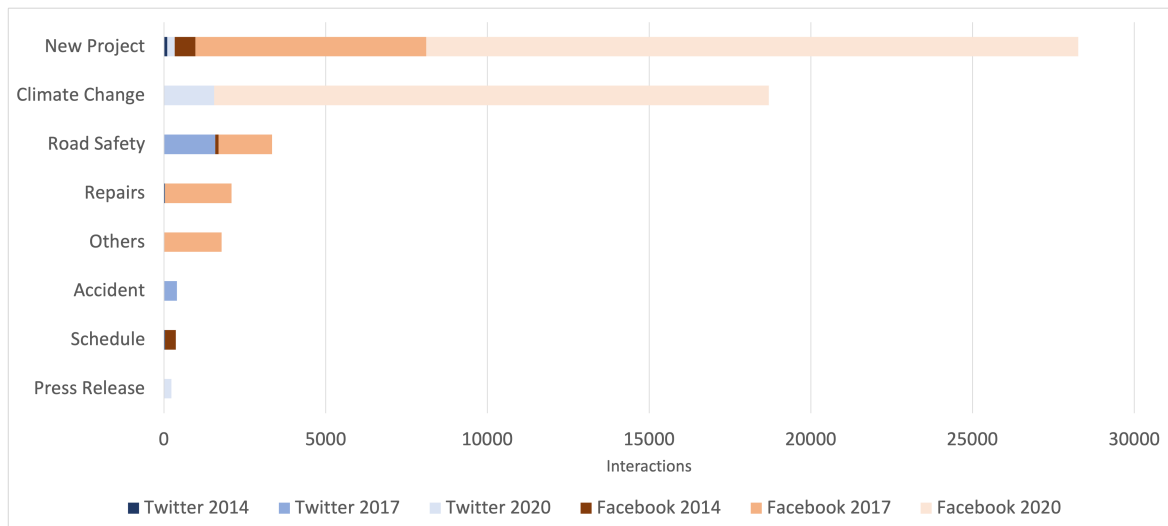


Figure 4.9.: INCOFER topic interactions. Source: Own Figure

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Post	Category
In Costa Rica we have dreamed of a modern, agile and safe electric train. And we are before the opportunity to have it! So it's now or never, and we can't let the train go away.	New Project
Today we produce our electricity with the power of water, wind and the sun; With that same clean energy our new Electric Train will move without polluting. So it's now or never, and we can't let the train go away.	Climate Change and New Project
Drivers continue to be reckless, driving on the right-of-way. Gentlemen drivers, remember that the train has right of way	Road Safety
INCOFER crew working in Tibás, a place where the road was washed due to heavy rains	Repairs
Don @luisguillermosr in the cabin of the Apolo train heading to Cartago!	Others
Once again collision with heavy vehicle in San Francisco de Heredia causes delay in Ala-SJ train	Accident
Special schedule in Cartago- SJ- Cartago today from 8 pm and until Wednesday 2nd at 11:30 am every 35 min #TrainCR Rate 550 colones	Schedule and Fares
Clarification regarding the note published in the CRHOY digital medium entitled "Grupo Nación and the Government signed an agreement that would increase the costs of the electric train by almost 150,000 million colones":	Press Release

Table 4.2.: Example of the topics posted by INCOFER. Source: Posts from Facebook and Twitter of INCOFER

4.2.1. Interview

The interview was carried out with experts working every day on the social networks of the INCOFER. The interview began by knowing the general goals of the PTA. INCOFER's primary objective is to provide quality rail transportation to the provinces of San Jose, Alajuela, and Cartago. Also, to improve this service every day to increase the mobility of people in the country.

The INCOFER tries to use their social networks to improve their services. Their main purpose of social media is to inform users of the train service, especially on issues related to daily operations. There is a second objective that has to do with the institutional work. Here, they focus on publishing all the progress made in terms of projects. With this strategy, they want to show the people that "there is a path to rail modernization".

They use Facebook and Twitter in a "very simultaneous way". What they post on Twitter is, normally, to be found on Facebook. Facebook has, in their opinion, the advantage that they can explain the issues without limitation of characters. Meanwhile, on Twitter, they are limited to 140 characters. INCOFER tries to avoid threads because they feel that people are too lazy to inquire and read more. Therefore, the same information is to be found on Twitter and Facebook. The only difference is that on Facebook the explanation will be in greater detail and on Twitter, the information will be condensed.

On both platforms, INCOFER receives complaints and suggestions. They read all the comments that are sent to them and try to respond to all the messages. Twitter is the most used platform for this purpose, but INCOFER also receives a lot of private messages on both platforms. When the issues are repetitive they mobilize the message internally until it reaches the persons who have the power of solving the issue. The company has already identified the trolls who attack the institution. Depending on the issue addressed the INCOFER replies or simply ignores them.

The train's operating schedule is very limited. This prevents the company from researching trending topics occurring in the city and update the schedules and frequencies. They only change their schedule if requested by a municipality for a specific activity.

4.3. Tranvia de Cuenca

This section presents the results obtained from the recollection of the posts of Tranvia de Cuenca's Facebook and Twitter. Also, the main findings of the interview realized with experts from Cuenca will be explained. Figure 4.10 shows a word-cloud made from the most common words and tags used by Tranvia de Cuenca on Twitter. Most of the content published on this platform was public information, concerning schedules and repairs. Normally, each publication is accompanied by a photograph. Tranvia de Cuenca focused on an educational

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be made on foot or with the tram. It is to be found on Twitter and Facebook. Then, almost all of the traffic deviations were posted on Twitter in the year 2017. Content regarding the tram's schedules was mostly posted on Twitter. Lastly, before the construction began, Tranvia de Cuenca posted renders on Facebook.

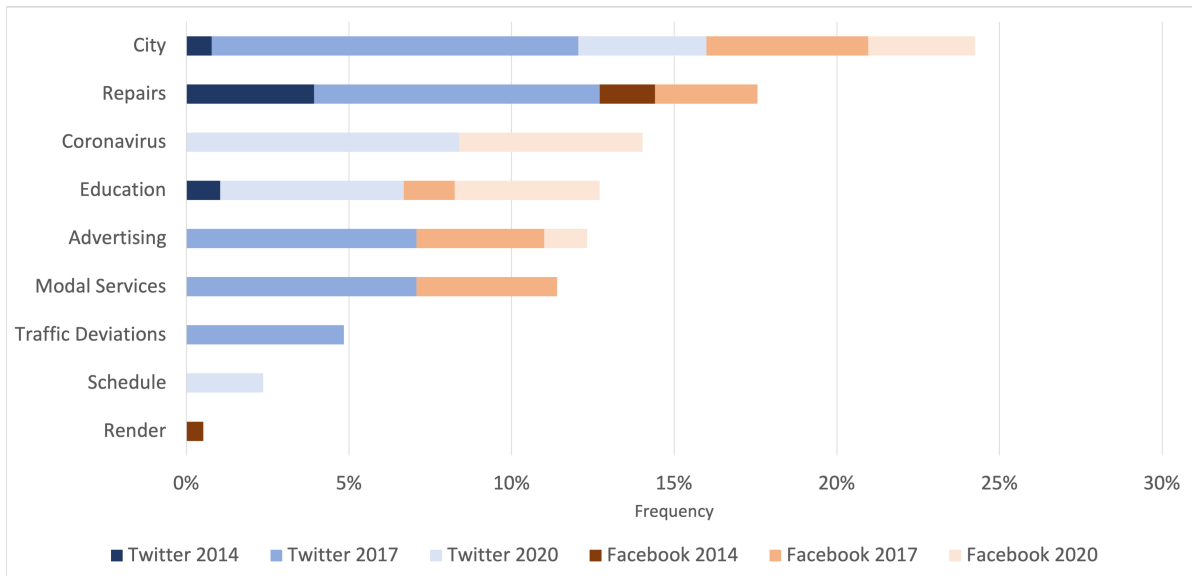


Figure 4.12.: Tranvia de Cuenca topic frequency. Source: Own Figure

Figure 4.13 shows the topics that obtained more interactions in the years 2014 (darker shade), 2017 (middle shade), and 2020 (light shade). The category with more interactions was "fares". These publications of ticket prices was very engaging for the citizens. It received almost the same amount of interactions on both platforms, in the year 2020. The second bar shows an education campaign made to raise awareness among citizens about the importance of following the tramway signals. This campaign obtained interactions equally on Facebook and Twitter in 2020. But in 2017 only Facebook obtained interactions. Posts containing other mobility options (such as walking and cycling), as well as new bicycle parking were highly accepted on Twitter and Facebook. This content was, especially, accepted on Facebook in 2017. Meanwhile on Twitter in 2017 and 2020 to a lesser extent. Publications containing tourist sites in the cities obtained almost the same number of interactions as modal services. Posts related to the city of Cuenca received more interactions in 2017 on Facebook. Meanwhile, on Twitter, they received interactions in 2017 and 2020. In 2020, Tranvia de Cuenca published regulations for traveling with pets on the tram. These publications were welcomed by the citizens, as previously it was not allowed to travel with pets on public transport. The repairs, constructions, and renders obtained interactions mostly on Facebook in 2014. Lastly, the schedules posted by the PTA were engaging for the Facebook users in 2020.

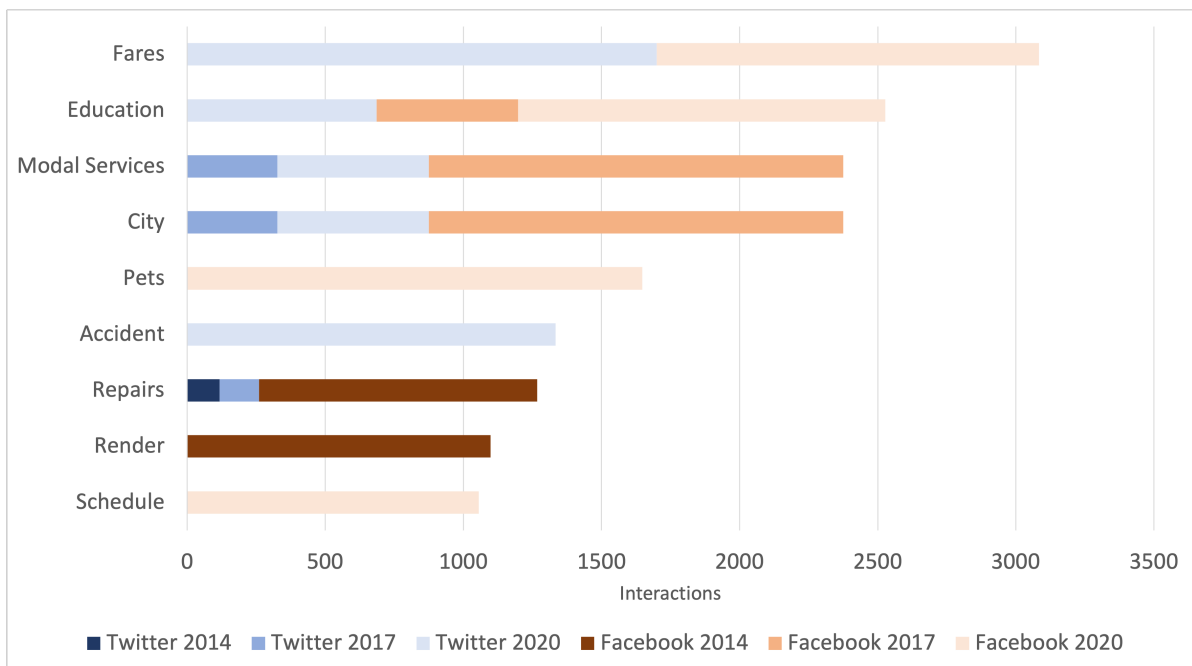


Figure 4.13.: Tranvia de Cuenca topic interactions. Source: Own Figure

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Post	Category
On these days enjoy the Historic Center, take care of the spaces with vegetation and the flowerpots, do not deposit garbage	City
In the Milchichig descent the traffic lanes are enabled in both directions, drive with caution there are asphalt patching works in progress.	Repairs
In coordination with entities of the Municipal Corporation we clean and maintain the flowerpots, located in the pedestrian crossings of the tram route. Help us take care of them. #TheTranvíaVaPorqueVa	Coronavirus
We work directly with the public, our staff remains at the stops to educate on the use of pedestrian crossings and respect for traffic signals. We need your collaboration. #TheTranvíaVaPorqueVa	Education
Thank you for being part of the economic reactivation. Remember that in this link you can find the businesses and services you need.	Advertising
If you visit Cuenca or live here, visit the Santa Ana handicraft square, you can do it on foot or by vehicle with total normality.	Modal Services
Due to the expansion of the work front of the tram in the Gaspar Sangurima, there are changes in the traffic.	Traffic Deviations
IMPORTANT! We remind citizens that the tram pre-operation is underway. The units circulate on the route until 6:00 p.m. Respect the traffic signs.	Schedule
This is how the Tram will work in Cuenca, Municipality of Cuenca EMOV EP Cuenca Telecuenca HD ET	Render
We remember that the Tram already has a rate, this week the Cantonal Council defined the rate for this new means of transport.	Fares
In the #TranvíaCuenca everyone is #Bienvenidos-ABordo remember that you can travel with your pet with the necessary precautions.	Pets

Table 4.3.: Example of the topics posted by Tranvia de Cuenca. Source: Posts from Facebook and Twitter of Tranvia de Incofer

4.3.1. Interview

The person who was interviewed by Tranvia de Cuenca was the project manager. The interview, like the others, was conducted after data collection. This allowed the interview to be individualized according to the data collected. The interview began by asking about the general objectives of the Tramway. The tramway has had three key stages.

1. The first was conceptualization. The project was born out of the need to clear road congestion, improve noise and environmental quality, and reduce the number of vehicles passing through the city. This, trying to transport a greater number of people in a smaller space. This was the objective in 2012-2013.
2. Then, it was the construction of the tramway trying to cause the least amount of affections possible in the shortest time. Due to different issues, the construction of the tramway lasted almost seven years, causing a deterioration between the company and the citizens who were affected by this construction. In 2019 the construction ends and the last stage of the tramway begins; the operation.
3. The objective in this stage is to transport the maximum amount of passengers.

Therefore, the objectives of the social networks also varied according to the main objective of the company. With the conceptualization of the project, the objective of the social networks was "to visualize the benefits of a project like this; punctuality, accessibility, less travel time". In the construction stage, the information was divided into two. In 20% of the cases, content about the benefits was published. In 80% of the cases, there was information about street closures or basic services that would be affected by the construction. From 2017, when the operation model was clear, an attempt was made to "win over the citizens". This is due to all the damages that were caused from 2013 to 2017. Finally, the operation stage. During this stage, schedules, frequencies, bio-security issues such as spacing, disinfection of the trams, and road safety were communicated.

Both Facebook and Twitter were used in the same way until the mid-2020s. Due to the commercial operation and because "the reactions of the followers were different on Facebook and Twitter" the platforms were given different objectives. Twitter proposed a more direct message, of daily communication, of what is happening in the system. Meanwhile, Facebook was used mainly for road safety and the benefits of the Tramway.

All feedbacks on social networks are followed up. Not all of them receive a response. In specific cases (such as when a card stops working) the citizen is contacted directly. Efforts are made to follow up internally, through the different departments, to "generate a satisfactory response to the citizen". All comments are treated equally, no content is prioritized. A response manual was implemented in 2021. These responses are generated automatically. Others require some analysis. All feedbacks are taken to a database. There, specific follow-up

is given to the incidences reported by the same citizen. Response times are also incorporated into the database to measure, and be able to improve, how long it takes to resolve an incident.

This PTA has been planning operations for a year. The only adaptations that are made are due to accidents or failures of the tram. No activities or trending topics are taken into account when planning the transportation system. What has been attempted on several occasions is that the PTA generates a popular hashtag, to encourage citizens to use the tram service.

The director of the Tramway agreed with the results. She was asked why so much importance was given to issues of the municipality of Cuenca. She commented that "being part of the municipal government, we have to communicate governmental issues". She was also consulted about the advertising that was done to local stores. She commented that "it was part of a compensation for the damages that the stores along the tramway route had to mitigate the damages they had during the construction stage".

In terms of learning from using social networks for the PTA, she highlighted two. The first one is credibility. Having credibility with citizens is fundamental for communication. What is communicated must be reflected outside the social networks. The second one, is a lesson learned. She found that when trying to "communicate a lot" (i.e. make many publications) the information was diluted. It is necessary to have a more organized communication, with a maximum of three topics. This way you can reinforce what you want to communicate.

4.4. Münchner Verkehrsgesellschaft

This section presents the data recollected for the MVG. For this PTA, 15% of the monthly Twitter posts and 30% of the monthly Facebook posts were recollected in the years 2014, 2017, and 2020. Twitter was more used than Facebook. As shown in Figure 4.1, the MVG posted around 200 publications on Twitter, while on Facebook only 20 monthly posts were made. The MVG used Twitter only to provide real-time information. Figure 4.14 shows the most common words used by the MVG on Twitter. The content of each publication was summarized in one or more words. These words are also displayed in the PTA's Twitter word-cloud. All posts made by the MVG on Twitter were real-time updates. It can be seen how the majority of words allude to common problems of their services (damage, protest, damage of a train, schedule deviation, etc.). The content of Twitter did not include any type of media.

Facebook content, unlike Twitter, included also public information. Because of this, the number of topics covered in this social network was greater (since it is not limited to talking only about service incidents). Figure 4.15 shows the most common words used on Facebook and the most frequent topics discussed on this platform. The word-cloud shows that the most-posted content was public information, followed by real-time updates. Content on this social network ranged from posts telling the company's story, activities, and raffles. Normally,

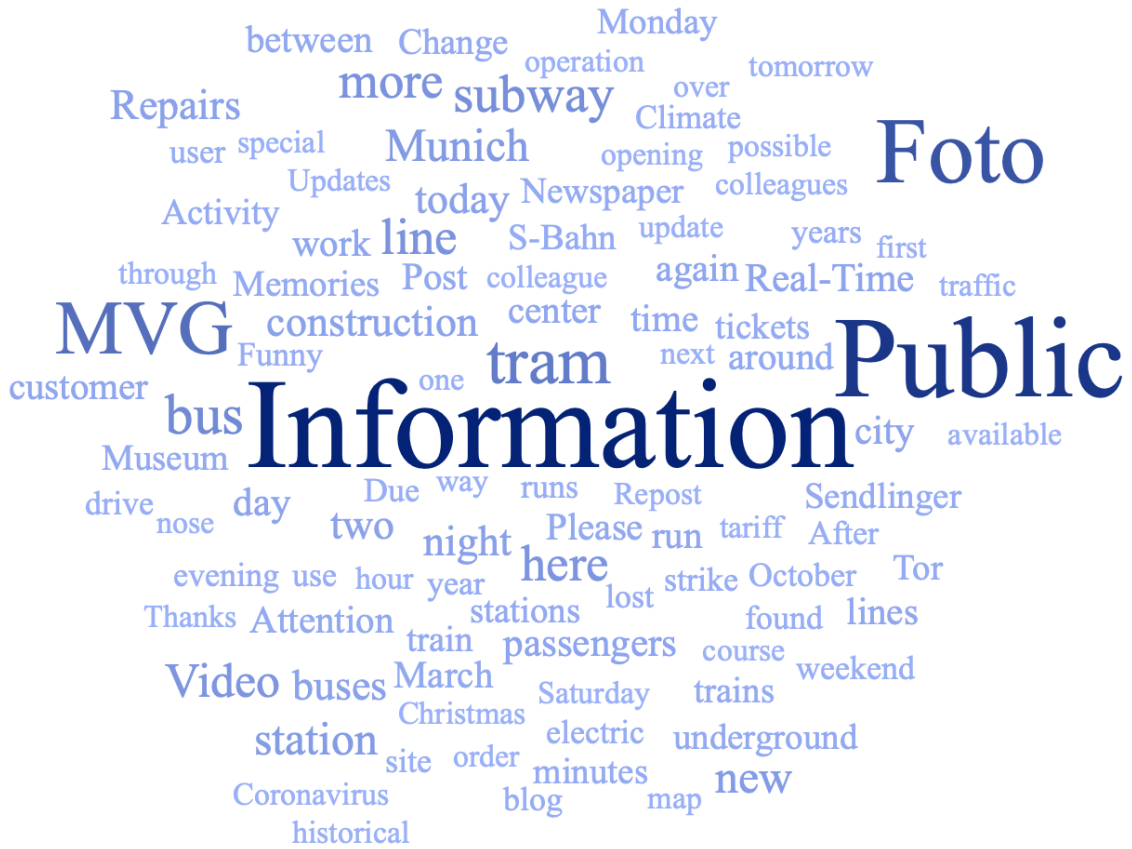


Figure 4.15.: Word-cloud of the MVG's Facebook. Source: Own Figure

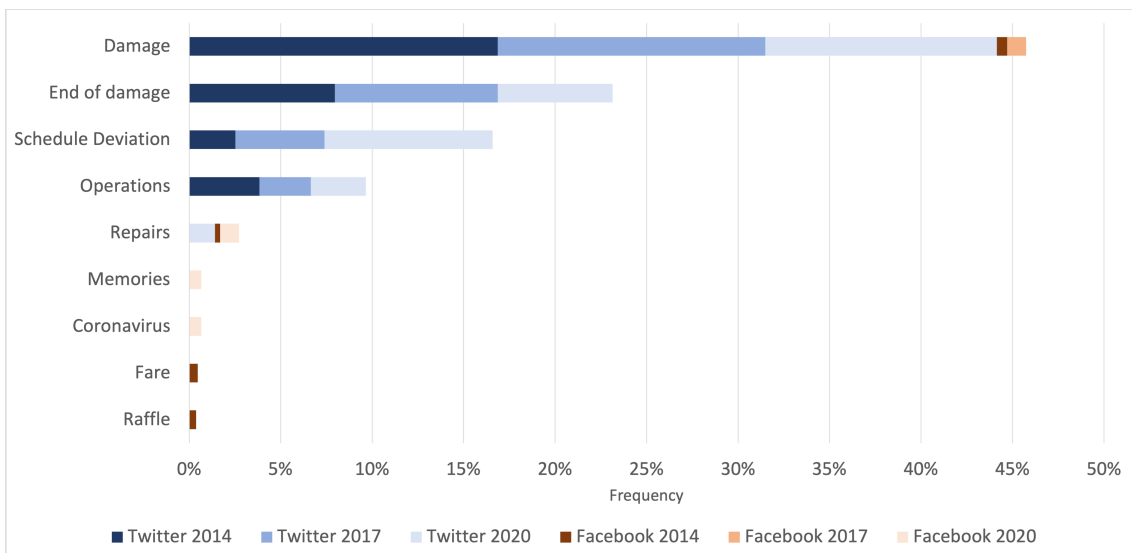


Figure 4.16.: MVG topic frequency. Source: Own Figure

4. Results

Even though Twitter was more used by the MVG, Figure 4.17 shows that the content of Facebook received more interactions. This figure has the five posts with more interactions obtained on Twitter and the five posts with more interactions each year on Facebook. The category "others" represent different topics that, separately, were published infrequently. The topic with the most interactions was lost and found. MVG published objects that children forgot on trains and buses, such as stuffed animals or school bags, in an attempt to move readers. Also, within this category, funny content or riddles were published. For example, a riddle was made with emojis for people to guess which station was being talked about. This content generated interactions in 2017 and 2020. Meanwhile, on Twitter, this category contains only information about the strikes of the company and how these strikes are going to affect their services. In 2020, these posts received a lot of interaction because the company reduced their services in the middle of the corona-virus pandemic. The reduction caused people to have to ride closer together. The next bar shows the category "memories". This category refers to content, photos and stories of what the public transport service and the city was like in the past. The memories, published on Facebook, were very consistent through the years. In all three years posts alluding to the past of the trains in Munich received a large number of interactions. The third most interacted category is the Corona-virus measures adopted by the PTA. The measures produced interactions mainly in Facebook, but also on Twitter. This category began in March 2020. On the other hand, raffles and fares generated the most interactions in the year 2014. Figure 4.16 shows that most of the posts including fares or raffles were posted this year. The difference between the interactions received on Twitter and Facebook is very large. The contents that caused more interactions on Twitter were the strikes (shown in the category "others"), the Corona-virus measures, when damage got repaired, and the deployment of the different task forces (shown in category "operations").

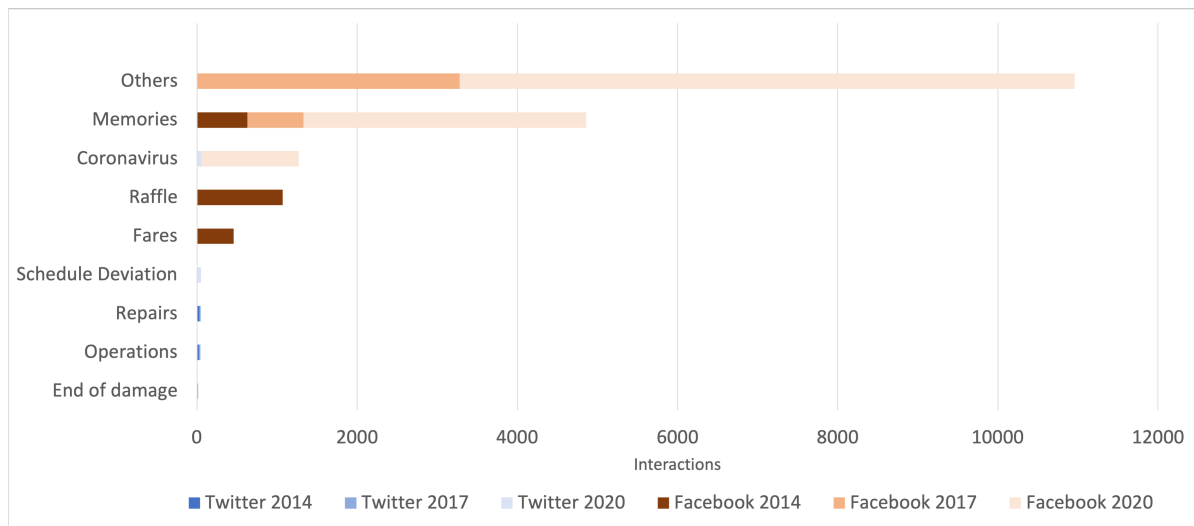


Figure 4.17.: MVG topic interactions. Source: Own Figure

4. Results

Post	Category
Line (s) U3: disruption due to damaged train ... [more]	Damage
Line (s) 16 + 17: Disability ended ... [continue]	End of damage
Line 60: delays due to disruption to the route	Schedule Deviation
Line (s) 18 and 19: route interruption due to the use of an emergency doctor at the Am Lokschuppen stop ... [more]	Operation and Schedule deviation
Lines U1, U2, U8: Weekend July 14-16. Bottlenecks in the center due to construction work on Sendlinger Tor	Repairs and Schedule deviations
The tram has been going beyond Munich's city limits to Grünwald since 1910. Now the contract for the continuation of line 25 has been signed by MVG, district of Munich and the municipality of Grünwald. Our historical jewel in January was taken on this route and is 44 years old. It shows the class F 2.10 railcar with type g 1.48 sidecar on Robert-Koch-Strasse in January 1970. The picture was taken by Johann Pollitzer, a real tram fan - he also has the large-format oil paintings with Munich tram scenes in Commissioned, which are hanging in the MVG Museum today.	Memories
Dear passengers, we would like to remind you: Please not only cover your mouth and nose in the vehicle, but also at the subway stations and stops. Thank you!	Coronavirus
Schoolchildren and apprentices watch out: You can use the 365-euro MVV ticket for the coming summer holidays. We recommend buying online - it's quick, easy and completely contactless in times of corona	Fares and Coronavirus
Summer, sun, cinema: you can win 3x2 free tickets a week in the MVG Couples Quiz from. How was your high score? Click here for the quiz	Raffle
Line (s) 139: obstruction due to a bomb found on Hochäckerstr. ... [continue]	Others

Table 4.4.: Example of the topics posted by the MVG. Source: Posts from Facebook and Twitter of MVG

Facebook. Since the year 2017, the Metro de Madrid has tried to gain the perception of being inclusive. This category includes posts that addressed the equal treatment of women and men, improvements in the metro facilities for people with reduced mobility, and workshops for Madrid Metro staff to fight against LGTB+phobia. In 2017, the company posted many campaigns to recollect food and school supplies for people in need. This content, as can be seen in the "charity" category in the Figure 4.20, was published mainly in 2014 on Facebook. The main campaigns took place during the Christmas season. Also, in 2014 and 2017, Metro de Madrid tried to promote itself as an option in the fight against climate change. This content includes data comparing the pollution emitted by the metro with the pollution emitted by other means of transport. Also, along with the "new projects" category, they tried to position themselves as an environmentally friendly option by building new bike racks, new charging stations for electric cars, and changes to stations that lead to energy savings.

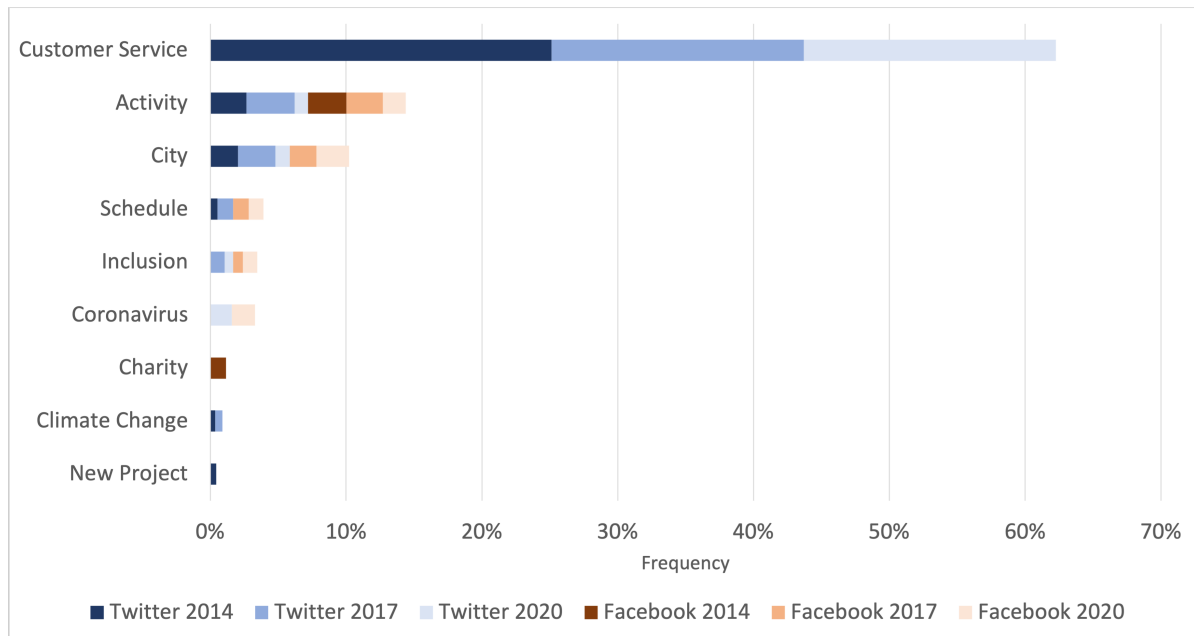


Figure 4.20.: Metro de Madrid topic frequency. Source: Own Figure

Figure 4.21 shows the interactions that each topic received on Twitter and Facebook. The subjects that received the most interactions were those related to the city. In this category, activities in places of interest were published, such as parks, museums, tourist sites, bars, and restaurants that were accessible by subway. Especially in 2020, this category was published more frequently (excluding bars and restaurants), due to the corona-virus pandemic. People reacted a lot to this content, which offered them to visit places in the city of Madrid in the open air. Since the city was in lock-down for a couple of months the PTA when restrictions were removed tried to engage the citizens by posting the most important sites in Madrid. The other category includes topics that were posted much less frequently, but still generated a lot of interactions. Some important topics were; repairs that were made to trains and stations

4. Results

(especially on Twitter). Also, on Facebook, many old photos of the city and the subway were posted, with a text telling the story of the image. It also generates a lot of impact on citizens when the Metro opens job positions and recruits people through social networks. Other unique topics that generated impact were: a marriage proposal made in a train station and the measures that have to be taken to take pets on the train. All posts related to the corona-virus generated many interactions in 2020, both on Twitter and Facebook. This content included reminders of bio-security measures, measures implemented by the company to ensure the health of users, and the loosening of restrictive measures adopted by the city of Madrid. In 2017, the activities published by Metro de Madrid obtained more interactions than in 2014 and 2020. These activities were mostly soccer matches, concerts, and festivals. In all activities, citizens were urged to arrive by public transport. In some cases, train frequencies were even increased to meet the needs of users. Even though most of the posts of charity were made on Facebook in 2014, the few posts made in 2020 obtained more interactions. The charity events carried out in 2020 were to recollect food for families affected by the corona-virus pandemic.

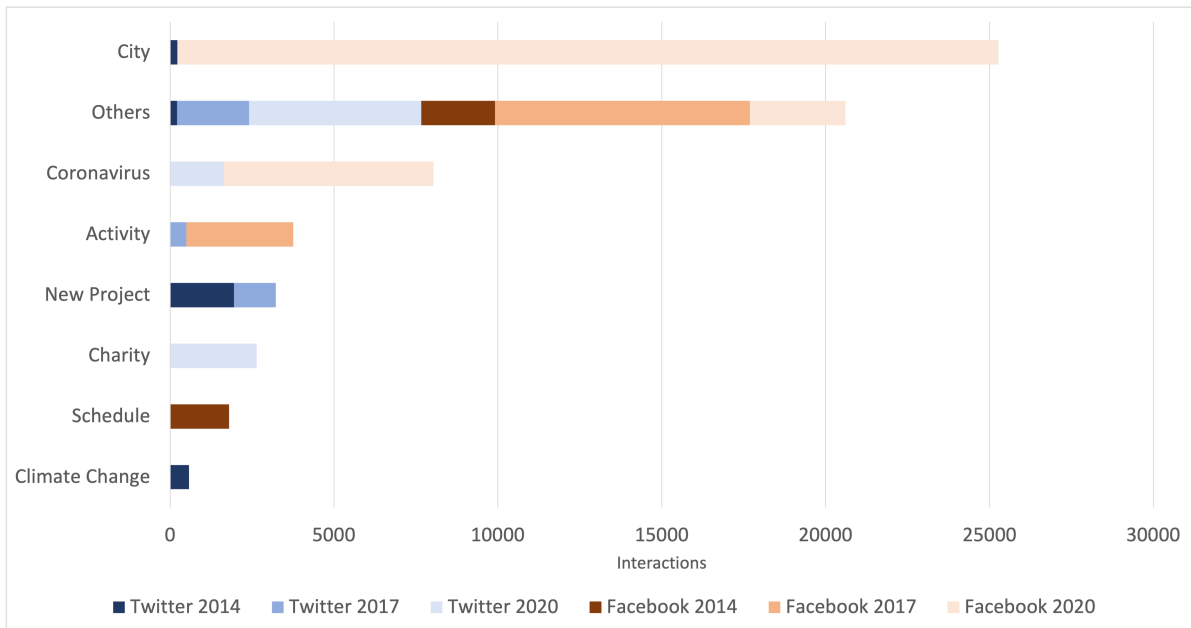


Figure 4.21.: Metro de Madrid topic interactions. Source: Own Figure

Post	Category
it is already repaired. Happy weekend.	Customer service
If you like art, hurry up! Several of the top 10 exhibitions are about to close.	Activity
VíEs Madrid, but it doesn't seem like it. Lunametropoli magazine lists 10 atypical places in Madrid:	City
The Regional Transport Consortium will open offices for the management of the transport card on the following Sundays:	Schedule
Metro de Madrid staff receive diversity training to fight against LGTBphobia. To know more	Inclusion
The Community of Madrid establishes new extraordinary measures in public transport.	Coronavirus
Dear passengers, we would like to remind you: Please not only cover your mouth and nose in the vehicle, but also at the subway stations and stops. Thank you!	Coronavirus
The Community donates 5,000 Metro tickets to Messengers of Peace for people with limited resources: http://ow.ly/Lpyz308ujLl	Charity
Do you know that Metro is the least polluting transport? We will tell you about it in this video.	Climate Change

Table 4.5.: Example of the topics posted by the Metro de Madrid. Source: Posts from Facebook and Twitter of Metro de Madrid

5. Discussion

This chapter contains a discussion of the results. Firstly, a summary of the results is made. The discussion is based on three aspects: 1) the different social media platforms, 2) the uses of social media over time, and 3) the uses of social media depending of the characteristics of the cities. After these three aspects, the strengths and limitations of the chosen methods are discussed.

The results presented in chapter 4 demonstrated the different strategies that PTAs have used in social networks to plan public transportation systems. To plan and improve public transport, it is necessary to involve as many online users as possible [40]. Therefore, this study presented the topics that caused the most interactions in the different countries. Topics such as new projects, the corona-virus, customer service, and activities in the city helped PTAs to get interactions. People's interactions are key to improving the quality of public transportation because they represent the users' opinions of the service obtained. All the comments received in these publications should be taken into account to plan the public transport service by storing them in a database. In this way, the reports can be cataloged in different categories. The categories should be based on the different departments (for example, if it is a cleaning complaint it is cataloged with the name of the department in charge of cleaning). This way it is easier to transmit the complaints to the different departments in charge of repairing the issue. With the database, it is possible to determine which have been the most frequent complaints, in this way it is possible to address the most uncomfortable problems of the users first.

5.1. Social Media: Facebook vs Twitter

Two different social networks were selected for this study: Facebook and Twitter. The purpose of this selection was to better understand whether the PTAs follow a model of one-size-fits-all strategy or whether each platform serves a specific purpose. To plan public transport services with the help of social networks, user feedback is needed. Without it, the service would be planned without using the insights provided by every-day users of public transport. Thus, a two-way-communication on social media is a key point to take advantage of social media resources. To have a two-way-communication with users it is necessary to create content that generates numerous interactions, which encourages citizens to participate and give their opinions on social networks. Therefore, the line in social media between marketing and urban transportation planning is blurry because, without interesting content for social media followers, feedbacks are not received. Marketing must go hand in hand with planning so that,

as the social media manager of Tranvia de Tenerife said, "social media favors our content" and it can be visualized by many people and users can engage in improving the services of PTAs.

Both social networks have their pros and cons. Marketing is very important on Facebook because PTAs have to work with Facebook's algorithm. This algorithm gives more importance to publications with more interactions generated (likes, comments, and shares) [41]. In other words, publications with more interactions presented a greater reach than those that generate few interactions. Therefore, PTAs have to create engaging content, so that they can be benefited from the Facebook algorithm and their publications have a greater reach. For this reason, the PTAs have been publishing many raffles, emotional content (such as the objects that children lost on the trains), and old photos of the city and the train. These topics generated numerous interactions, regardless of the city that published them. In the Tranvia de Tenerife interview was said that this way "the Facebook algorithm will understand that the PTA is someone interesting and will spread my publications". Based on the fact that Facebook content does not appear chronologically, this platform is not the most appropriate to report on recent events.

On the other hand, on Twitter, posts are sorted chronologically [42]. So they all have the same probability of being seen by users regardless of the number of likes, retweets, and comments the post gets. Content reaches platform users as soon as it is published. Therefore, this platform is suited to inform followers about breaking news and real-time updates. In this way, relevant information can be reported and seen by the target audience instantly. Thus, public transport users can plan their trips in an informed way, taking into account all the important news of the desired route.

Another difference is the length of the posts. On Twitter, for example, content has to be synthesized in 280 characters. Even though threads exist, PTAs said that "threads do not reach as many users" as a single post and therefore, they try not to use them. In the interviews, the PTAs commented that Twitter users "are very lazy and don't like to do a lot of digging". They are more interested in expedited content, where reading is less time-consuming. Facebook, on the other hand, has no character or word limit. Therefore, all the contents can be explained in a more extensive and detailed way. On this platform, according to PTA reports, "the user will normally read" and be more interested in the content, even if the post is long.

PTAs used Facebook to post content related to new projects, educational campaigns, and city memories. On Facebook, new projects, such as the incorporation of a new line, the construction of new stations, and the impact they will generate, can be explained in detail. Also, educational campaigns can be explained in a better way without limiting the number of characters. For instance, old photos of the city or the tramway are usually accompanied by a story. This story can be told without barriers on Facebook.

Another significant difference is the feedback from people. On Facebook, people usually

write private messages to contact PTAs. Facebook users do not expect an immediate response. Some PTAs claimed that "it can take three to four hours and users [of Facebook] are sometimes surprised by the speed of the answer". This allows the department in charge of social media to transmit the message to the respective department with the ability to execute and receive concrete and accurate responses on the subject.

Meanwhile, on Twitter, people post complaints and comments publicly on the timeline, tagging the PTAs. Occasionally, private messages are received, although in smaller numbers than on Facebook. Besides, not all PTAs' profiles have private messaging enabled. On Twitter, people expect an immediate response. The Tranvia de Tenerife social media manager told that "if you get asked on here [Twitter] and in a matter of 10 minutes you haven't generated an answer, you're generating a bad reaction". Therefore, PTAs do not have time to respond with accurate messages from the respective department with the capacity to execute. A standardized message is needed to let the user know that everything possible is being done to fix the problem. Some PTAs even respond twice to the message. Once with the standard message and then with the accurate response once the appropriate department is consulted.

Some issues can be addressed in the same way in both social networks. A database should be created from all the feedback received, both on Facebook, Twitter, and traditional customer service platforms (such as telephone, email, and in-store). By including all customer service platforms in one database, the most frequent and important passenger complaints can be visualized. This allows the PTAs to focus their forces on important aspects for the passengers.

One aspect that almost no PTA uses is popular content in networks. Both platforms show trending topics and activities in places close to the user's location. On Facebook, it is events. On Twitter, it is trending topics. These events and popular topics can be used by PTA to promote their services. Also, PTAs can include these factors in the planning of public transportation. Depending on the topic and the event, it is possible to adapt the public transport service normally offered to meet the needs of users attending these events. For example, if many people are talking about an upcoming election, the PTA should remind citizens of the different ways, using public transportation, to get to the polling centers. Or in the case of a soccer match or concert in the city, which generates many publications on social networks, the PTA can promote the services it offers to reach these events. Even if it is an event that had little planning, and therefore the PTA did not take it into account when planning the schedules, they can try to provide a differential service (e.g. higher frequencies) to meet the needs of the public.

5.2. Timeline: 2014, 2017 and 2020

This part of the discussion focuses on how PTAs' social networks have been changing from 2014, 2017, and 2020. The lapse of three years between them allows observing more easily the

different strategies used by the PTAs over the years. Figure 5.1 shows a summary of the most frequent topics on the social networks of the five PTAs.

Many PTAs have been modifying their content to be better received by their followers on social networks. Depending on the interaction received on some topics, this content is more and more frequent on social networks. Such is the case of posts referring to the memories of the city and the PTA. In 2014 and 2017 this topic was published occasionally especially on the social networks of the MVG and the Metro de Madrid. In 2020, as seen in Figure 4.16 this content was published much more frequently. This is because in 2014 and 2017 it generated many interactions (Figure 4.17).

From 2017 onwards, PTAs have tried to add inclusion-related topics. All PTAs had this trend, but it is especially noticeable in Metro de Madrid, as shown in Figure 4.20. PTAs took advantage of commemorative days (e.g. Women's Day), charitable activities, and training to fight LGTBphobia to ratify their position as an inclusive transit PTA. "63% of the 301 stations are accessible for people with reduced mobility and this percentage is expected to continue growing in the coming years. "We are the metro with the most elevators and escalators in the world." was a post made by Metro de Madrid which proves the commitment to offering a more inclusive service. They also publicized new projects and repairs to make stops and facilities more accessible to people with reduced mobility.

The year 2020 had unique themes. Due to the corona-virus pandemic, PTAs had to include this topic in their social media posts. This content, mostly of an informative and preventive nature, was published by the five PTAs. This type of content, which mostly published the measures that the PTA adopted to prevent the transmission of the corona-virus, was, despite having been published only in 2020, a topic that obtained many interactions in all cities. This content demonstrates people's interest in viewing content related to current issues. PTAs can use current topics that are of common interest (e.g. topics related to public safety or topics related to popular activities such as elections) to promote the services they offer. By using social networks to monitor trending topics and popular activities, PTAs can publish content related to these and even offer special services (e.g. more frequent trains) to meet users' needs.

On the other hand, many themes have been constant throughout the three years analyzed. For the five PTAs considered in this study, issues such as activities in the city, customer service, and schedules have been present all three years. Normally, the PTAs publish activities that take place every year and can be reached by public transportation. In this way, they not only encourage people to attend the events but also encourage them to arrive by public transport. Also, many places of interest or tourist sites with easy access to public transportation are published. Places such as parks, museums, stores, restaurants, and bars have been included by all PTAs in their social networks. Customer service, both by private messaging and public complaints, has been received throughout the three years. Finally, social networks have been used by PTAs as an efficient and fast way to inform citizens. Thus, schedules have been

published over the years by PTAs.

Many issues have been constant over the years for certain PTAs. For example, INCOFER published during the three years the new projects they were carrying out. In this way, they informed citizens about the purchase of new trains, the construction of new stops, and the implementation of new train lines. This generated a lot of interaction with the citizens. The PTA had the opportunity to listen to users' opinions and answer their questions. In some cases, the PTA even modified the initial proposal based on citizen suggestions. Another theme that was constant during the years analyzed was the raffles held by the Tenerife tramway. This PTA conducted the raffles only on its Facebook profile. The raffles generated many interactions, so the Facebook algorithm favored the content published by the PTA. In this way, the following publications could reach more people.

Over the years there is content that is posted on one platform and then the PTA decides to post this content on another platform. MVG, for example, started posting repairs done on Facebook. Then, in 2020, it posted them on both Facebook and Twitter. In the case of INCOFER, it happened similarly. Repairs were first published, in 2014, on Twitter. Then, in 2017 they were published mostly on Facebook. Finally, in 2020 they were again published more frequently on Twitter. In Cuenca, the educational campaign started on Facebook in 2017. By 2020 this campaign was published on both platforms.

In most cases, all the contents have been changing. There is only one exception; the MVG Twitter profile. The three years have been monotonous on this social network. All the contents are real-time updates referring to damages, schedule changes, operations of different task forces in public transport, and when the damage occurred was repaired. Figure 4.16 represents this consistency on Twitter over the years.

This shows that the PTAs are selecting the content, and the appropriate platform to publish it, according to the experience they have had. Another important aspect that influences the content over the years is the specific intentions of the PTAs for a given year. In the case of INCOFER, for example, the publication of new projects grew in 2020, because this year they intend to approve an interurban electric train. Also, if the company wants to receive support from citizens for a certain project, the content of social networks will be affected that year. Finally, the content that is published is also affected depending on the city. Cities are dynamic, every year there are new activities and new popular topics. This causes people's attention to change constantly. Because of this, public transport PTAs have had to adapt to the dynamism of the city and publish content that is interesting and generates interactions at the moment.

5. Discussion

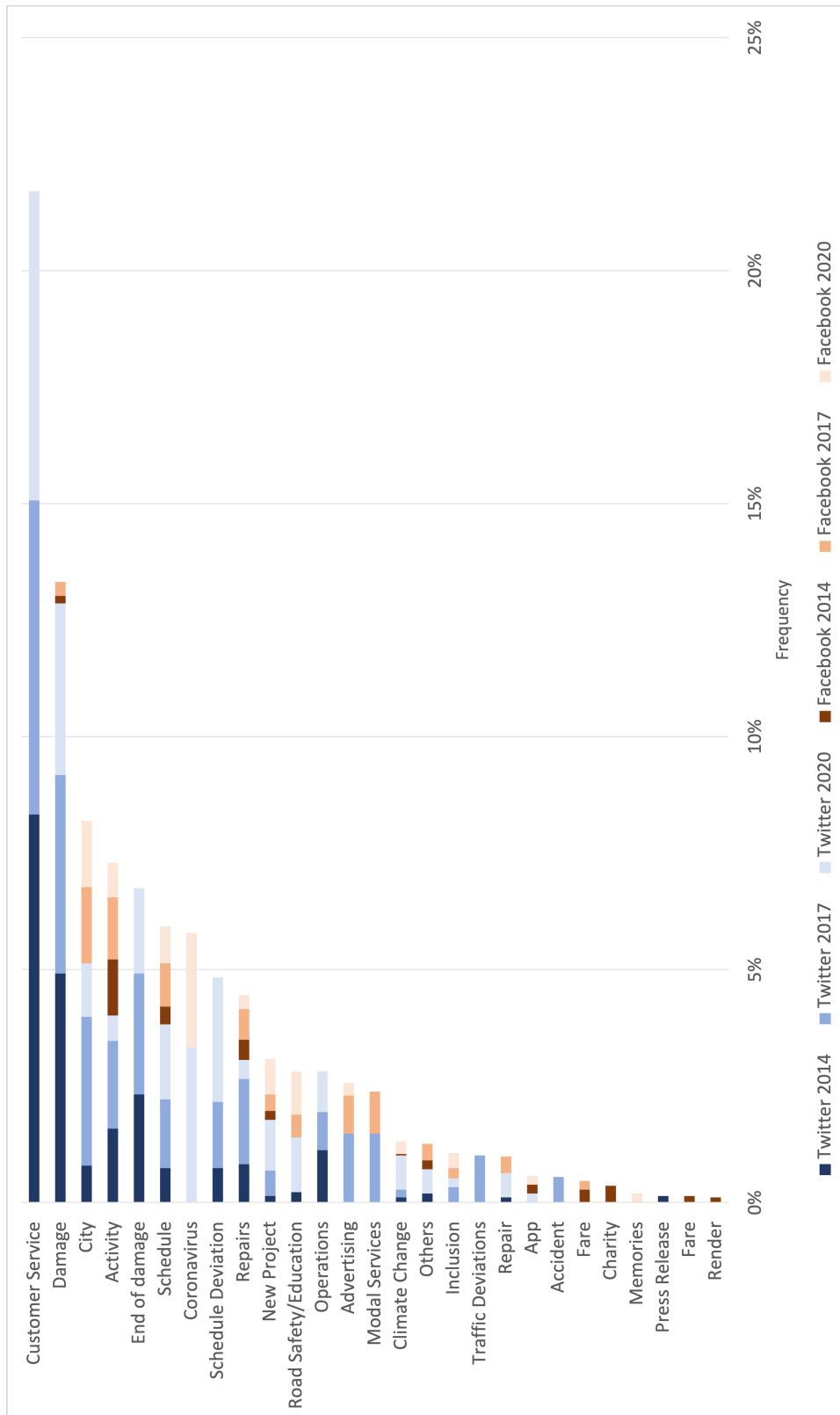


Figure 5.1.: Overall topic frequency throughout 2014, 2017, and 2020. Source: Own Figure

5.3. Cities: Munich, Madrid, Cuenca, Tenerife and San Jose

Finally, the different characteristics of the chosen cities and how they influence the strategies used, as well as how successful the strategies are, will be discussed. The geographic, economic, and social characteristics of each city make the management of social networks vary. These differences will enrich the study, as each PTA will be analyzed, regarding which are the best strategies to use, according to their characteristics.

The cities of Madrid and Munich are the two largest cities considered for this study. The gross domestic product of both cities is over 100 million euros. These cities have the highest public service coverage. In the case of Munich it is 449 km and in the case of Madrid, counting only the Metro, which was the social network analyzed, it has a length of 294 km. These characteristics denote how advanced the public transport services are in both cities, which infers the interest that the topics discussed in social networks can generate. The citizens of these cities are not interested in seeing the company's new projects. In Figure 4.16 and Figure 4.20 it can be seen that neither of the two PTAs frequently published this topic. While the Figure 4.17 and Figure 4.21 show that the citizens did not react in a great way to these topics either. The citizens of large cities are more interested in efficient public transportation services. The Madrid graph shows that people interacted with the PTA because of the schedules. It could be by showing support for the new schedules/frequencies established by the PTA or by urging the PTA to take into account specific situations for schedule planning. In either case, it shows people's interest in having efficient and accessible services.

Meanwhile, the region of the Canary Islands and the countries of Costa Rica and Ecuador have gross domestic product lower than 100 million euros. In the case of Tranvia de Cuenca and Tranvia de Tenerife, the length of the lines is under 21 km. In the case of INCOFER, the length of the train is 72 km. The differences between MVG and Metro de Madrid with these three PTAs are very large. Likewise, are differences in what users want to see on social networks. Users of these PTAs interact more with content related to new projects, repairs, and construction. In Figures 4.5, 4.9, and 4.13 it is to see how in the case of Cuenca people reacted a lot to the repairs that were made. In the case of Costa Rica and Tenerife, users interacted especially with publications related to new projects. Citizens also reacted a lot to the institutional transparency publications made by the Cuenca Tramway and INCOFER. This shows that people always expect a transparent institution, which accepts the mistakes made and is willing to improve.

Finally, there are topics that regardless of the city are well received by users. People interacted with publications related to activities in the city. Regardless of the activity, the publications received a lot of support from people. These types of activities or places of interest (such as parks or museums) were used by the PTAs to encourage people to use the public transport network. In some special activities (e.g. soccer matches), train frequencies were changed to offer better service. Another aspect that is well received is customer service. Public transport users like to have a direct communication option with the PTA. Answering

most of the feedback is very positive, as people appreciate feeling listened to.

5.4. Strengths and limitations of the study

Most previous studies focused on the uses of social media for PTAs only focus on a short period (two or three months), recollecting around 3,800 posts [30]. Also, they tend to take into account PTAs from the same country or region, with very similar characteristics. This makes the results more homogeneous for all the PTAs considered.

Meanwhile, for this study, the years 2014, 2017, and 2020 were taken into account. Almost 5,000 posts were recollecting and analyzed, which shows that collecting 30% of the monthly posts is a good percentage. This allowed to observe the different strategies that the PTAs have used over the years, to catalog whether they were successful or not. Also, by including public transport PTAs from different countries and regions, it was observed which strategies work best according to the characteristics of the country.

The different years and PTAs taken into account for this study made the results of this study unique. The vast majority of PTAs, regardless of size or country characteristics, can use this study as a reference to guide them in the strategies that can be beneficial. Along with these strategies, it lays the foundation for using social media as a method to plan and improve public transportation service.

The collection and analysis of the posts from the five different PTAs allowed classifying the content into different categories. Based on the topics covered, different strategies the PTA used throughout 2014, 2017, and 2020 were discovered and whether they have been changing. This analysis led to more personalized interviews with each PTA. In each interview, specific strategies used and the choice of platforms was asked about when there was a significant difference. This mixed-method approach allowed to formulate different interviews for each PTA, thus, the insights collected were more specific and detailed.

Nevertheless, the methods used in this study presented shortcomings. The study depends on having people working in the PTAs who are willing to collaborate. These people are usually very busy, especially in the year of the corona-virus, so contacting them is very difficult. Especially in the larger PTAs, where the bureaucracy to schedule an appointment with a representative of the PTA is more complicated.

Because of this, the study was limited to interviewing only the PTAs in Costa Rica, Tenerife, and Cuenca. For this reason, the study lacked details of the management and objectives of the larger PTAs.

5.5. Mixed Method Approach

The collection and analysis of publications from the five PTAs provided a snapshot of the strategies each PTA used throughout 2014, 2017, and 2020. It also visualized the most frequent themes in these years. By quantifying the data with the five-point scale, it was possible to determine which strategies got the most interactions over the years and if there were any significant changes in the interactions received. Also, with this process, it was shown which topics and strategies were applied only on Twitter, which were applied only on Facebook, and which were applied on both platforms. Finally, the scale allowed a comparison of whether a topic generated more interactions on a specific platform. Unfortunately, using this approach by itself does not answer why a strategy was only used on a specific platform or whether this use was premeditated nor can the use of feedbacks for public transport planning be commented on.

Because of these shortcomings, it was necessary to combine quantitative data with interviews (qualitative data). The interviews allowed not only to validate the data collected, but also to learn why PTAs used different strategies over the years, why they published certain topics only on one platform, and whether these acts were premeditated. Also, it was possible to obtain details of how user feedback was handled. What process each PTA has in place to answer complaints and to forward them to the respective departments of the PTA.

Due to the limitations of quantitative data, it was necessary to use an explanatory mixed-method approach. This approach attempts to minimize the disadvantages of using only quantitative data or only qualitative data by combining both methods in the study. By basing the interviews on previously collected data, the study not only gained depth in the responses and analysis obtained but also was able to conduct PTA-specific interviews, taking into account the data that each PTA obtained. The details gained from the interviews provided a deeper analysis of the different strategies that have been used.

6. Conclusion

Chapter six presents a summary of the most important points of the thesis, with which the research question is answered. Recommendations for future studies in this field are also given.

6.1. Conclusions

After having collected and analyzed the posts of Tranvia de Tenerife, Tranvia de Cuenca, Tranvia de Cuenca, Tranvia de Tenerife, Metro de Madrid, and Metro de Madrid, and having used a mix method approach to conduct the interviews with the representatives of these PTAs, it was possible to state that PTAs, in most cases, have used social media in a bidirectional manner. This means that they are not only used to announce important events such as route or fare changes, but also to listen to users' opinions and, from these opinions, to improve the service. Table 6.1 shows the strategies that generated the most interactions. The strategies were divided into three groups: 1) PTAs located in large cities (more than one and a half million people), 2) public transport companies that provide their services in medium and small cities, and 3) general recommendations for all PTAs.

Type of PTA	Facebook	Twitter
Big Cities	Efficiency and Accessibility	Schedules and Efficient Customer Service
Small and Medium Cities	New Projects, repairs, and education campaigns	New projects, repairs and constructions
For all PTAs	Activities in the city	Activities in the city and customer service

Table 6.1.: Most successful strategies for PTAs. Source: Own Table

Apart from the strategies shown in Table 6.1, it was concluded that it is important to generate entertaining content on Facebook, due to the algorithm of this social media. In this way, important content, related to current issues of the PTA, will be able to reach as many people as possible. PTAs have tried different strategies. The study recommends testing different strategies and measuring the level of interaction with which people respond. Some ideas that PTAs have used include raffles for tickets to games, activities, or concerts, publishing old stories about the city and the PTA, and appealing for emotional photos such as lost items left

by children on public transportation.

This step is key, in Facebook, because the basis for planning and improving an efficient and user-friendly public transport system is to take into account as many opinions as possible. By generating interactions, users 1) can see the company's content more easily and 2) can give their opinion about the services and give valuable recommendations to be taken into account. What the PTA publishes, regardless of the content, has to have the widest possible reach. In this way, more people can be informed, better plan their next trips and even persuade private car passengers to use public transport. The more people who see the publications, the higher the percentage of people who give their opinion. The more people who give their opinions, complaints, and recommendations, the more robust and reliable the database of this information will be. With more comments on the same topic, PTAs can determine that it is a common problem that affects a large number of people. On the other hand, if there are few complaints, there is always the doubt of whether the complaint is true or if it was made just to annoy and damage the image of the PTA.

As explained in more detail in Chapter 5, Facebook's algorithm makes posts with more interactions appear more on users' timelines. On this platform, not all posts are given the same importance. Therefore, PTAs are advised not to use Facebook to post real-time updates, as the publications are not necessarily going to appear at the right time. Instead, the chronological timeline used by Twitter is more suitable for this type of information. By always displaying the latest content, users will be able to be informed about breaking news as it happens.

With the results of this study, PTAs are advised to moderate the number of daily publications on the platforms. When too many posts are made, with too many varied topics, the information is diluted in the social network. PTAs reported that it is more difficult to convey a message to users when they post a lot. Therefore, it is advisable to focus on two or three topics and try to publish all the content of the day based on these topics, in a way that does not require so many publications. This way, followers will be more aware of the topics discussed in the PTAs' social networks and, therefore, they will have a better criterion of the opinions that the PTAs are looking for. This makes the active participation of citizens more focused on the topics of interest of public transport PTAs and thus allows them to collect the users' points of view to improve the service.

To use the staff, financial resources, and time of the transit PTA efficiently, it is recommended to create a database of all comments, complaints, and suggestions made by users. This database should include the issue addressed, the department that would be responsible for repairing the complaint, how often riders complain about the issue, and the average response time. In this way, staff and financial resources can be allocated to the situations that occur most frequently. Also, the PTA can visualize which response times need to be improved.

All PTAs are encouraged to create automated responses for users. On Twitter, people

get annoyed if they don't receive a response soon. Especially small companies, which have limited human resources, should create such responses to avoid generating dissatisfaction. Once there is time, and a possible solution to the problem, the person in charge of responding to comments can do so without any pressure.

Finally, social networks do not only work for PTAs to improve their service. Also, PTAs can use this platform to create educational and informative campaigns, so that the behavior of citizens helps to have efficient public transport service. Issues such as not getting on the bus if the doors are closing, respecting bus and streetcar signals, or not damaging the facilities, can work to make public transportation improvements.

The public transportation service should take into account the opinions of every-day-users. They are the ones who can point out shortcomings and areas for improvement more easily, as they use the service constantly. Therefore, PTAs will improve substantially by taking into account the complaints and needs of the users. This improvement, together with the good management of social networks, causes more people to use the public transportation network [43].

6.2. Recommendation for future studies

The study established a methodology that, although two interviews were not conducted, worked quite well for collecting data and gaining more detailed information. Even so, the following aspects can be improved for future studies:

Include cities with different characteristics. Given that the goal of the study is to get more people to use public transportation to reduce greenhouse gas emissions, more regions need to be analyzed. As each country has different characteristics and, therefore, people behave differently in social networks, it is necessary to analyze the strategies that have been successful in other regions. In this way, PTAs in these regions will be able to plan public transport with the help of strategies specific to the characteristics of the city and the PTA. Since this study focused only on European and Latin American PTAs, future studies could be taken into account in other regions such as North America, Asia, and Africa.

Investigate further the databases of the PTAs. This study confirmed that many PTAs use databases to store the comments and complaints that users give them on social networks. As such feedback is the basis for planning a public transport service taking into account users' opinions, it is necessary to explore the characteristics of these databases. By investigating what information is stored in them, what important information is missing, and comparing different databases, it is possible to optimize them, thus facilitating the improvement of the public transport service.

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The appendix contains an extract from the collection of posts and the analysis of the interviews. Abbreviations are used for column headings. R/S stands for Retweets and Shares, and C is for the number of comments.

A.1. Extract of the recollection of Posts

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Post	PTA	Date	Social media	R/S	C	Like	Tags
Obstructions on bus line 52 due to a large demonstration ... [more]	MVG	3/7/2014	Twitter	1	0	0	Real-time update, protest
Line (s) 18: Disability due to illegal parking ... [more]	MVG	3/8/2014	Twitter	0	0	1	Real-time update, object in train-line
Line U3 / 6: delays due to vehicle malfunction at Sendlinger Tor in the direction of Münchner Freiheit ... [more]	MVG	3/8/2014	Twitter	0	0	2	Real-time update, damage
Line (s) 17: Line interruption due to a car in the track area at the Botanical Garden ... [more]	MVG	3/20/2014	Twitter	0	0	2	Real-time update, object in train-line
Line (s) 16 and 18: The route is interrupted due to a parking offense at Isartorplatz ... [more]	MVG	3/22/2014	Twitter	0	1	0	Real-time update, object in train-line
Line 16: route interruption due to illegal parking - truck in the track area at the Federal Fiscal Court ... [more]	MVG	3/23/2014	Twitter	0	0	0	Real-time update, object in train-line
Line (s) 51, 164, 165: obstruction due to traffic accident ... [continue]	MVG	3/23/2014	Twitter	1	0	0	Real-time update, accident
Line (s) 144: obstruction due to fire service in Hohenzollernstr. ... [continue]	MVG	3/23/2014	Twitter	0	0	0	Real-time update, operation
Line (s) 19: The route is interrupted due to a traffic accident involving two cars at the Holzkirchen train station ... [more]	MVG	3/23/2014	Twitter	0	0	1	Real-time update, accident

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Line (s) U3 / U6: disability ended ... [continue]	MVG	3/24/2014	Twitter	0	0	1	Real-time update, end of damage
Line (s) 25: Line interruption due to a defective vehicle in the track area ... [continue]	MVG	3/24/2014	Twitter	0	0	0	Real-time update, damage
Line (s) 19: Line interruption due to a damaged train at Lenbachplatz ... [more]	MVG	3/24/2014	Twitter	0	0	1	Real-time update, damage
Line (s) 18 and 19: route interruption due to a traffic accident on Trappentreustrasse ... [more]	MVG	3/24/2014	Twitter	0	0	2	Real-time update, accident
Line (s) U4: route interruption due to the use of an emergency doctor ... [more]	MVG	3/24/2014	Twitter	0	0	0	Real-time update, operation
Line (s) U3: disruption due to a damaged train in Obersendling ... [more]	MVG	3/24/2014	Twitter	1	1	0	Real-time update, operation
Line (s) U2, U7: operational disruption due to a willful emergency stop ... [continue]	MVG	3/24/2014	Twitter	1	1	2	Real-time update, emergency stop
Line (s) U3, U6: operational disruption due to fire service ... [more]	MVG	3/25/2014	Twitter	2	0	0	Real-time update, operation
Line (s) 23: Disability ended ... [continue]	MVG	3/25/2014	Twitter	0	0	2	Real-time update, end of damage
Line (s) 27 + 28: Route interruption due to a traffic accident in Barerstr. ... [continue]	MVG	3/25/2014	Twitter	0	0	0	Real-time update, accident
Line (s) 18 + 19: obstruction due to a	MVG	3/25/2014	Twitter	2	0	2	Real-time update, accident

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defective truck at the main station ... [more]							
Line (s) 16 + 18: route interruption due to traffic accident at Herkomerplatz ... [more]	MVG	3/25/2014	Twitter	0	0	2	Real-time update, object in train-line
Line (s) 19: The route was interrupted due to a traffic accident in Ampfingstrasse. ... [continue]	MVG	3/26/2014	Twitter	0	0	1	Real-time update, accident
Line (s) 20 + 21: Line interruption due to damage to the overhead line in Dachauer Str. ... [more]	MVG	3/27/2014	Twitter	0	0	1	Real-time update, damage
Line (s) 16, 17, 18, 19, 20, 21: Disability ended ... [continue]	MVG	3/30/2014	Twitter	0	0	0	Real-time update, end of damage
Line (s) 15 and 25: obstruction due to icy catenary ... [more]	MVG	4/2/2014	Twitter	0	1	0	Real-time update, damage, weather
Line 18: The route was interrupted because of a tree on the overhead line at the National Museum ... [more]	MVG	4/3/2014	Twitter	4th	0	1	Real-time update, damage
Line (s) 23: Line closed because of an aerial bomb ... [more]	MVG	4/3/2014	Twitter	5	0	3	Real-time update, bomb
Line (s) 140/141/142: obstruction due to an aerial bomb ... [more]	MVG	4/3/2014	Twitter	5	0	0	Real-time update, bomb
Line (s) U4 / U5: disruption due to damaged train ... [continue]	MVG	4/5/2014	Twitter	0	0	0	Real-time update, damage
Line (s) 27: Disability ended ... [continue]	MVG	4/5/2014	Twitter	0	0	1	Real-time update, end of damage

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Line (s) 25: route interruption due to storm damage ... [more]	MVG	4/6/2014	Twitter	3	0	1	Real-time update, damage
MVG bus and tram lines: schedule deviations due to weather conditions ... [more]	MVG	4/7/2014	Twitter	3	0	1	Real-time update, damage, weather
Line 100: obstruction due to road construction work ... [more]	MVG	1/18/2017	Twitter	0	0	0	Real-time update, repairs
Line (s) U4 / U5: operational disruption due to a vehicle malfunction at Karlsplatz ... [more]	MVG	1/26/2017	Twitter	0	0	1	Real-time update, damage
Line (s) 52 and 132: Disability due to the Christopher Street Day parade ... [more]	MVG	1/26/2017	Twitter	0	0	1	Real-time update, activity
Line (s) 54: obstruction due to traffic accident ... [continue]	MVG	1/26/2017	Twitter	0	0	0	Real-time update, accident
Line (s) 100: obstruction due to demonstration ... [more]	MVG	1/26/2017	Twitter	1	0	0	Real-time update, protest
Disability "BR-Radltour" ended ... [more]	MVG	1/26/2017	Twitter	1	0	1	Real-time update, end of damage
Line (s) 20/21: Route interruption due to a traffic accident at Olympiapark West ... [more]	MVG	1/27/2017	Twitter	2	0	1	Real-time update, accident
Line (s) U1: operational disruption due to a sick passenger ... [continue]	MVG	1/27/2017	Twitter	1	1	0	Real-time update
Line (s) 18: Route interruption due to a traffic accident on Fachnerstrasse ... [more]	MVG	1/27/2017	Twitter	0	0	1	Real-time update, accident
Line U4 / 5: Shuttle traffic and SEV due to	MVG	1/27/2017	Twitter	1	0	0	Real-time update,

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line disruption ... [more]							damage, schedule deviation
Line (s) 16 and 17: obstruction due to a traffic accident on Arnulfstrasse ... [more]	MVG	1/27/2017	Twitter	1	0	1	Real-time update, accident
MVG bus routes X30, 50, 130, 144, 184, 185: delays due to heavy traffic ... [more]	MVG	1/28/2017	Twitter	0	0	0	Real-time update, traffic, schedule deviation
Line (s) 62,63, N43, N44 and 58: obstruction due to road construction work ... [more]	MVG	1/28/2017	Twitter	0	0	0	Real-time update, repairs
Disabilities on buses and trams due to large demonstrations ... [more]	MVG	1/29/2017	Twitter	0	0	0	Real-time update, protest
Line (s) 18: Route interruption due to parking offenders ... [continue]	MVG	2/3/2017	Twitter	0	0	0	Real-time update, object in train-line
Line (s) 18/19: Disability ended ... [continue]	MVG	2/3/2017	Twitter	0	0	0	Real-time update, end of damage
Line (s) 18/19: route interruption due to traffic accident ... [more]	MVG	2/4/2017	Twitter	0	0	1	Real-time update, accident
Line (s) 58: Disability ended ... [continue]	MVG	2/6/2017	Twitter	0	0	0	Real-time update, end of damage
Line (s) U5: delays due to a signal box fault ... [more]	MVG	2/6/2017	Twitter	0	0	1	Real-time update, damage
Line 18/19: route interruption due to traffic accident at Hermann-Lingg-Str. ... [continue]	MVG	2/7/2017	Twitter	0	0	1	Real-time update, accident

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Line (s) 18: Route interruption due to parking offenders ... [continue]	MVG	2/7/2017	Twitter	0	0	0	Real-time update, object in train-line
Line (s) 53, 144: diversion due to fire service in Hohenzollernstr. ... [continue]	MVG	2/8/2017	Twitter	0	1	0	Real-time update, operation
Line (s) 16 + 17: Disability ended ... [continue]	MVG	2/9/2017	Twitter	0	0	0	Real-time update, end of damage
Line (s) U3, U6: disruption due to damaged train on the Poccistr. ... [continue]	MVG	2/9/2017	Twitter	0	0	1	Real-time update, damage
Line (s) 18 and 19: Route interruption due to a vehicle malfunction on Barthstrasse ... [more]	MVG	2/10/2017	Twitter	0	0	1	Real-time update, damage
Fault on the S1 due to a bridge damage in Moosach ... [more]	MVG	2/10/2017	Twitter	0	1	2	Real-time update, damage
Lines 100, 153 and 154: obstruction due to a police operation on Theresienstraße ... [more]	MVG	2/10/2017	Twitter	0	0	0	Real-time update, operation
Line (s) 19: Route interruption due to a fallen passenger at the Rathaus Pasing stop ... [more]	MVG	2/13/2017	Twitter	0	0	1	Real-time update
Line (s) 19: Line interruption due to a car on the high track ... [more]	MVG	2/14/2017	Twitter	0	0	0	Real-time update, object in train-line
Line 178: obstruction due to burst water pipe in Knorrstraße ... [more]	MVG	2/21/2017	Twitter	0	0	0	Real-time update, damage
Line (s) 12: obstruction due to traffic accident in the track area ... [more]	MVG	2/22/2017	Twitter	0	0	0	Real-time update, accident

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Line (s) 18: Route interruption due to parking offenders ... [continue]	MVG	2/22/2017	Twitter	0	0	1	Real-time update, object in train-line
Line (s) 144: obstruction due to tunneling work ... [more]	MVG	2/22/2017	Twitter	0	0	0	Real-time update, repairs
Line (s) 18 and 19: Disability ended ... [continue]	MVG	2/22/2017	Twitter	0	0	1	Real-time update, end of damage
Line (s) 23: route interruption due to traffic accident ... [continue]	MVG	2/23/2017	Twitter	0	0	1	Real-time update, accident
Line (s) U3, U6: operational disruption due to fire service ... [more]	MVG	2/23/2017	Twitter	0	0	0	Real-time update, operation
Line (s) 27 + 28: route interruption due to a traffic accident in Barer Str. ... [more]	MVG	2/23/2017	Twitter	0	0	0	Real-time update, accident
Line (s) 27 + 28: Disability ended ... [continue]	MVG	2/23/2017	Twitter	0	0	0	Real-time update, end of damage
Line (s) 16: Route interruption due to vehicle malfunction ... [continue]	MVG	2/23/2017	Twitter	0	0	2	Real-time update, damage
Line (s) U2: Operational disruption due to interlocking fault ... [continue]	MVG	2/23/2017	Twitter	0	0	1	Real-time update, damage
Line (s) 19: Line interruption due to a BRK deployment in Bäckerstr. ... [continue]	MVG	2/24/2017	Twitter	0	0	1	Real-time update, operation
Line (s) U3, U6: operational disruption due to fire service ... [more]	MVG	2/24/2017	Twitter	0	0	1	Real-time update, operation

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Line (s) 15 + 25: Disability ended ... [continue]	MVG	2/24/2017	Twitter	0	0	0	Real-time update, end of damage
Line (s) 15 + 25: route interruption due to power failure ... [continue]	MVG	2/25/2017	Twitter	0	0	1	Real-time update, damage
Line (s) 15/25: route interruption due to a traffic accident on the Mengerschwaige ... [more]	MVG	3/1/2017	Twitter	1	0	0	Real-time update, accident
Line (s) U1 / U2: operational disruption due to the use of an emergency doctor at the U-Bf. Central station ... [more]	MVG	3/1/2017	Twitter	1	0	1	Real-time update, operation
Line (s) 18: Route interruption due to a fire brigade in Lehel ... [more]	MVG	3/6/2017	Twitter	0	1	1	Real-time update, operation
The tram has been going beyond Munich's city limits to Grünwald since 1910. Now the contract for the continuation of line 25 has been signed by MVG, district of Munich and the municipality of Grünwald. Our historical jewel in January was taken on this route and is 44 years old. It shows the class F 2.10 railcar with type g 1.48 sidecar on Robert-Koch-Strasse in January 1970. The picture was taken by Johann Pollitzer, a real tram fan - he also has the large-format oil	MVG	1/8/2014	Facebook	86	20th	121	Public information, photo, memories

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<p>paintings with Munich tram scenes in Commissioned, which are hanging in the MVG Museum today.</p>							
<p>It was nice: For the opening of the tram to Pasing on December 14th, the historic trains also ran with the historic line number 29. You can find out more about the 100-year history of the tram line to Pasing on Sunday on the first opening day in 2014 in the MVG Museum: There you can see the exhibition "Tram in Pasing", which was also set up at the opening ceremony in the town hall. The special show is included in the regular admission price. Further information</p>	MVG	1/10/2014	Facebook	11	10	76	Public information, photo, museum
<p>The new MVG Munich city map 2014 is here: In addition to the city and network map, you can find all underground, bus and tram stops as well as all S-Bahn stations, car sharing and taxi locations. The city map can be bought from newsagents and MVG customer centers for 3.50 euros.</p>	MVG	1/23/2014	Facebook	0	15th	24	Public information, photo, fare
<p>We proudly present: The first two electric buses for Munich! And on Saturday, October 21,</p>	MVG	9/7/2017	Facebook	0	32	235	Public information, climate change

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you can experience them for yourself at the MVG Museum ... Video:							
Because I wished it so badly: De App MVG Fahrinfo München talked to me in a boarish way. We have Oktoberfest fun all year round - if it's awesome (but only on the Android phone, because Apple koa Boarisch ko).	MVG	9/8/2017	Facebook	23	96	484	Public information, photo, funny
Help with heart: Our colleague has expanded the services of the MVG in a special case to include a home delivery service.	MVG	9/11/2017	Facebook	7th	25th	164	Public Information, Post Newspaper
We proudly present: Our new men's fragrance "Eau d 'U-Bahn"!	MVG	10/5/2017	Facebook	n / A	92	157	Public information, video, funny
Hardy cyclists watch out: We have opened 12 more bike stations. In Giesing, at Flaucher Biergarten, at Großhesseloher Brücke, in Lehel, at Rotkreuzplatz and and and ... All new locations can be found here:	MVG	10/17/2017	Facebook	1	4th	18th	Public information, climate change, modal services
News from our U3 construction site blog: Wheelchair user and subway fan Philipp Wollstein always gets on the U2 at Scheidplatz on his way to work. At the platform he got into conversation with a traffic foreman. And	MVG	10/21/2017	Facebook	15th	6th	129	Public Information, Post Newspaper, Inclusion

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then a long-cherished dream comes true for him							
Prospective trainees, take note: do you actually know our two professions, specialist in driving operations and clerk for traffic services? You can find everything about it here: www.swm.de/ausbildung. By the way, our application tram will be back on March 7th	MVG	2/8/2020	Facebook	3	14th	15th	Recruiting
We will replace over 70,000 fluorescent tubes in our subway stations over the next few years, we started here at Laimer Platz! The new LED lights are more environmentally friendly and last twice as long. More info:	MVG	2/11/2020	Facebook	2	36	201	Public information, photo, repairs, map
Historical gem from the recent past: Exactly 14 years ago to the day - on March 5, 2006 - nothing was going on Munich's streets anymore. Do you still remember the snow chaos?	MVG	3/5/2020	Facebook	95	93	503	Public information, history, photo
Together with the city of Munich, we are drawing attention to the so-called gender pay gap. On the occasion of the Equal Pay Day on March 17th, a train on line 19 with stickers for more fair pay travels through the city. This	MVG	3/5/1930	Facebook	9	11	104	Public information, photo, inclusion

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tram is still on the road until the end of the month							
From Sunday, March 8th, the sparks will fly again at night. The U5 rails between Neuperlach Süd and Innsbrucker Ring are getting a new polish! Therefore, buses will run until Thursday, March 12th from around 10:30 p.m. to replace the subway. More info:	MVG	3/7/2020	Facebook	18t h	20t h	132	Public information, repairs
Do you know all three underground stations? Hobby photographer Thomas was patient and waited a long time until the platform was finally empty - it was worth it	MVG	3/11/2020	Facebook	12t h	18t h	203	Public information, photo, user
Don't forget: From Sunday, March 15th, our rail grinding train will run again. Our rails are being given a new polish between OEZ and the main train station! Therefore, buses will run until Thursday, March 19 from around 10:30 p.m. to replace the subway. More info:	MVG	3/14/2020	Facebook	4th	11	52	Real-time update, repairs
Passenger train users are informed that next Friday, July 25, there will be no train service	INCOFER	7/24/2014	Twitter	3	0	two	Real-time update, schedule deviation
At this time, Ing. Guillermo Santana is holding a press	INCOFER	4/7/2014	Twitter	0	0	two	Public Information,

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conference regarding the adverse effects of the train.							Press release, photo
The train services for today remain in their normal schedule, there will be no special train for the reception of the National Team. RT	INCOFER	8/7/2014	Twitter	4	1	4	Public Information, activity
100 days report: Solís Rivera Administration!	INCOFER	8/28/2014	Twitter	0	0	0	Public Information, Repost
At this time press conference with the Executive President Ing. Guillermo Santana	INCOFER	12/8/2014	Twitter	0	0	0	Public Information, Press release, photo
Strengthening Law for INCOFER, opinion article by Ing. Guillermo Santana, Executive President	INCOFER	8/18/2014	Twitter	two	0	two	Public Information, Post Newspaper
At 10pm the extraordinary Cartago / San José / Cartago train service begins on the occasion of La Romería, it runs until 11am.	INCOFER	2/8/2014	Twitter	3	1	two	Real-time update, activity
INCOFER advances in the rehabilitation works of the railroad to Alajuela	INCOFER	8/21/2014	Twitter	0	0	3	Public Information, Photo (written), repairs
Train service users are informed that tomorrow, Friday, August 15, there will be no train service	INCOFER	8/15/2014	Twitter	two	0	two	Real-time update, schedule deviation
We are ready, in a few minutes we will go to Cartago with	INCOFER	9/15/2014	Twitter	6	1	16	Public Information, President, photo
Don @luisguillermosr in the cabin of the Apollo	INCOFER	9/15/2014	Twitter	3	0	two	Public Information,

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train heading to Cartago!							President, photo
While we carry out maintenance work we find a vehicle parked in the middle of the railway	INCOFER	7/5/2017	Twitter	60	16	24	Public Information, Campaign, road safety
UH: Delay with the 6:45 am train SJoquin - SJ. Due to truck stopped on the railroad track. We ask for your patience	INCOFER	5/15/2017	Twitter	25	7	12	Real-time update, schedule deviation, negligence
We continue to find vehicles invading the right of way this Sunday. Remember INCOFER works every day!	INCOFER	7/5/2017	Twitter	17	4	22	Public Information, Campaign, road safety
We return to normal hours this afternoon. Thanks to our workshop collaborators who repaired locomotive 81 on time!	INCOFER	5/9/2017	Twitter	5	5	39	Real-time update, end of damage
They remain canceled for this afternoon service from 16:55 Ulatina- Heredia and 18:00 pm from Heredia San José	INCOFER	5/19/2017	Twitter	7	1	two	Real-time update, services suspended
UH: SJO-CAR 7pm service presents technical problems, its departure is canceled tonight, we regret the inconvenience	INCOFER	5/9/2017	Twitter	7	3	4	Real-time update, services suspended
Hello! This morning all our services are scheduled normally. Good trip!	INCOFER	2/20/2020	Twitter	0	two	30	Public information, photo

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UH: Services to and from Cartago are CANCELED for this afternoon due to an investigation carried out by authorities for an apparent homicide on the railroad in Curridabat. Service enabled between Estación del Atlántico and CFIA.	INCOFER	2/19/2020	Twitter	ele ve n	3	19	Real-time update, services suspended
Good news! This afternoon ALL services on the San José-Pavas-Belén route are enabled.	INCOFER	2/27/2020	Twitter	0	0	14	Public Information, photo
Hi Alonso! This is because the train corresponds to the Cartago route.	INCOFER	2/20/2020	Twitter	0	1	0	Customer Service, answer
Yes, we are in train operation. The objective of the pitoreta is to announce the arrival of the trains to the level crossing and thus avoid collisions and accidents against the train.	INCOFER	2/16/2020	Twitter	0	1	16	Customer Service, answer
You are coming to Pavas Centro, Have a good trip!	INCOFER	12/2/2020	Twitter	0	0	two	Customer Service, answer
With the aim of collaborating in containing the spread of the disease. Likewise, INCOFER's Board of Directors approved a series of measures that will be followed by the institution in all its operations in the GAM.	INCOFER	3/23/2020	Twitter	1	0	4	Public Information, coronavirus

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Preventive actions taken by INCOFER within the framework of the Coronavirus (COVID-19) health alert.	INCOFER	3/6/2020	Twitter	8	7	32	Public Information, coronavirus
We share the message of the National Emergency Commission:	INCOFER	4/11/2014	Facebook	1	0	10	Public Information, Repost, Photo, Emergency
We remind all our users that the train service is only from Monday to Friday, at the established schedules.	INCOFER	11/21/2014	Facebook	0	fifteen	7	Public Information, schedule
It is reported that all train services remain with normal hours today, there will be no special trains on the occasion of the reception of The National Team	INCOFER	8/7/2014	Facebook	0	0	9	Public Information, Activity, schedule
We inform users that tomorrow Thursday there will be normal train hours, there will be NO additional service due to the activity that will take place at the National Stadium	INCOFER	4/12/2014	Facebook	two	fifteen	13	Public Information, Activity, schedule
At INCOFER we have a Services Comptroller's Office where all users can make suggestions, clarify doubts or make complaints. The Lcda. Carolina Arce, Comptroller of Services will channel your requests through the email	INCOFER	6/1/2017	Facebook	48	323	251	Customer Service, Public Information, honesty

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cservicios@incofer.go.cr or by phone: 25425802							
Throughout this weekend we have been carrying out repair and maintenance work on our 81 locomotive, which provides services between Cartago and San José, however it has significant damage to one of its chambers, for which some of the locomotive is being dismantled. its mechanical parts and this implies a greater number of hours in repair in our workshops and entails the cancellation of the following services for Monday, June 26 on the San José-Cartago route	INCOFER	6/25/2017	Facebook	57	132	229	Public Information, repairs, photo, schedule deviation
UH: Due to a collision in the La California sector in SJ we have delays in the train service between Curridabat and Pavas	INCOFER	7/21/2017	Facebook	14	38	116	Real-Time update, accident, negligence, schedule deviation, photo
UH: We present delays on the Cartago - San José route due to a heavy vehicle breaking through the railroad in the Barrio Dent sector	INCOFER	7/29/2017	Facebook	24	43	112	Real-Time update, accident, negligence, schedule deviation, photo
Services 09:30 SJO-ALA and 09:30 ALA-SJO will present a delay in their arrivals respectively this morning.	INCOFER	2/1/2020	Facebook	0	3	12	Real-Time updates, schedule deviation

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Departure: 06:30 CAR-SJO confirmed this morning, all services are provided normally	INCOFER	2/3/2020	Facebook	1	29	33	Real-time update
We carried out maintenance work this week in San Pedro, near La Ulatina, as part of the operations maintenance program, in this case we replaced a section of railroad tracks.	INCOFER	2/6/2020	Facebook	7	12	139	Public Information, repairs, photo
Service 17:30 SJO-ALA confirmed this afternoon with a 20-minute delay.	INCOFER	11/2/2020	Facebook	0	3	14	Real-time updates, schedule deviation
Important information TUESDAY, February 25.	INCOFER	2/25/2020	Facebook	3. 4	67	134	Public Information, schedule, photo
The Pavas-Heredia conventional train service in the afternoons and Heredia-San José in the mornings operated by Locomotive 86 has an additional car to the train, this means that the service capacity is increased by approximately 90 more people.	INCOFER	3/3/2020	Facebook	13	61	330	Public Information, new project, photo
Attention travelers! Due to the burial of the sardine that takes place tonight, today from 9:30 p.m. on ...	Tenerife tram	3/5/2014	Twitter	3	0	0	Public Information, schedule ,, activity
We lowered the price of the Month Pass !! ... As you hear, as of Saturday we lower the price of the Month Pass in ...	Tenerife tram	3/20/2014	Twitter	5	1	8	Public Information, fares

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We lowered the monthly subscription to 45 Eur, we extended the Via-Movil discounts until April 30 ... Do you like these ...	Tenerife tram	3/21/2014	Twitter	two	0	1	Public Information, fares
Can you help us convince the "bosses" so that we can continue giving good news? ... Give "like" to ...	Tenerife tram	3/27/2014	Twitter	1	0	0	Public Information
In Tenerife since October of last year we have already traveled by bus and Tram with our mobile phone thanks to the Via-Movil app	Tenerife tram	3/27/2014	Twitter	two	0	1	Public Information, app, customer service, answer, new project
Did you know that today Pope Francis signs the decree by which Father Anchieta will be made a Saint? ... At this time, ...	Tenerife tram	2/4/2014	Twitter	two	1	3	Public Information
Do you want us to take you to the 1939 Canarias Basketball Club match against Unicaja Baloncesto of this ...	Tenerife tram	04/01/2014	Twitter	two	0	0	Public Information, activity
Do you know all the details of Holy Week in La Laguna? ... Today, Friday of Dolores, we are already fully in ...	Tenerife tram	11/4/2014	Twitter	two	0	1	Public Information, activity
13 and a half million passengers in 2016 and we continue to grow ... thanks to you !! Are you coming? ... let's go !!	Tenerife tram	1/9/2017	Twitter	5	1	8	Public Information, achievement
Tomorrow the RRMM arrive at 16:30 in the Tram to the Trinidad stop ... Are you coming? ... Let's go !!	Tenerife tram	1/4/2017	Twitter	5	0	elev en	Public Information, activity, photo

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Today we offer the double tram service with improved frequencies until 2 in the morning for the benefit of our travelers	Tenerife tram	1/5/2017	Twitter	1	1	1	Customer Service, answer
mammoths on the loose ...	Tenerife tram	12/1/2017	Twitter	0	1	two	Customer Service, answer, campaign, education, photo
The Tram eliminates 2,000,000 car trips in 2016 ... Yes, traveler, according to the latest study by ...	Tenerife tram	1/25/2017	Twitter	5	0	4	Public Information, achievement, climate change
Our travelers give us a remarkable! After almost 10 years of service, the valuation of the Tram of ..	Tenerife tram	1/23/2017	Twitter	4	3	5	Public Information, appraisal, achievement
If you indicate the tram number we can transmit it to Maintenance in case there is a problem with the air conditioning	Tenerife tram	1/18/2017	Twitter	0	1	1	Customer Service, answer
On Line 2, single units will circulate, with a frequency of 15 min from 9:00 a.m. to 11:00 p.m. and 20 min from 11:00 p.m. to 12:00 p.m., ending the service on the 5th at that time. On the 6th it will operate with the usual frequency on a public holiday.	Tenerife tram	1/3/2020	Twitter	1	1	1	Customer service, answer, schedule
To upload it through the web you must register it previously. To do this, you must go through	Tenerife tram	1/23/2020	Twitter	0	two	0	Customer Service, answer

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one of our commercial offices or TITSA stations and have our colleagues register it for you. Without registering, you can recharge it at other points but not through the web.							
If you indicate the tram number, we will transmit it to our maintenance colleagues in case there is a problem with the air conditioning. The temperatures for which they are programmed are those that establish the comfort standards.	Tenerife tram	1/14/2020	Twitter	0	1	0	Customer service, answer, repairs
It was due to a technical incident.	Tenerife tram	1/5/2020	Twitter	0	0	0	Customer Service, answer
It must be requested through the web https://solicitud.tenmas.es	Tenerife tram	11/2/2020	Twitter	0	1	0	Customer Service, answer
Traveler attention! Due to an accident with a car in the roundabout of Avda 3 de Mayo at this time (19:10) the Tram only circulates between the Guimerá-Trinidad Theater stops, with the Fundación and Intercambiador stops being OUT OF SERVICE. Sorry for the inconvenience.	Tenerife tram	2/3/2020	Twitter	26	1	3.4	Real-time update, accident, photo, negligence
Good afternoon, our colleagues confirm that the work has already	Tenerife tram	2/6/2020	Twitter	0	1	1	Customer service,

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been carried out to solve the incident that you had indicated. Once again we reiterate our appreciation for your help to correct this error.							answer, photo
For those who once fought ... And for those who fight every day!	Tenerife tram	4/2/2020	Twitter	two	0	10	Public Information, holidays
The crashed tram being pulled from the line	Tenerife tram	2/3/2020	Twitter	5	0	3	Public Information, video, accident, negligence
Do you use the bus outside the metropolitan area? ... Do you want to save and be the first to enjoy a flat rate for all your trips? ...	Tenerife tram	11/8/2014	Facebook	9	5	18	Public Information, app, photo
Swimsuit, cholas, towel ... and the mobile to take the Tram and the bus using Via-Movil !! We take you to the buses, which take you directly to the beach. Of course, put on the cream for the sun and enjoy this wonderful day you will have to do it alone ... or with someone!	Tenerife tram	8/22/2014	Facebook	1	0	fifteen	Public Information, app, photo
Yesterday we had a visit from the Wehbe team who were shooting their new commercial in one of our vehicles and in our facilities. We love that you have the Tram for your campaigns!	Tenerife tram	9/17/2014	Facebook	1	0	18	Public Information, photo, advertising

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<p>Just one year after its launch, the first million trips by tram and bus have already been exceeded using Via-Móvil. Available on the App Store and on Google Play, it has put Tenerife at the forefront of ticketing systems in Spain, making its use common and daily among tram and bus customers. Simple, intuitive, inexpensive ... every day more travelers are opting to make their trips with Via-Móvil.</p>	Tenerife tram	9/23/2014	Facebook	6	7	31	Public Information, app, photo
<p>This afternoon from 7:00 p.m., with free admission, an interesting talk will be offered at the facilities of the Municipal Library of Santa Cruz -</p>	Tenerife tram	9/30/2014	Facebook	3	1	fifteen	Public Information, memories, photo
<p>Do you already have your costume ready? ...</p>	Tenerife tram	2/21/2017	Facebook	7	5	58	Public Information, activity, funny
<p>Traveler, remember that tomorrow Friday 02/24/17 we will circulate all day with DoblesTranvías, with a frequency at rush hour of a Tram at each stop every 10 minutes.</p>	Tenerife tram	2/23/2017	Facebook	8	3	16	Public Information, schedule, activity, photo
<p>Piñata weekend arrived at</p>	Tenerife tram	3/3/2017	Facebook	1	0	19	Public Information, photo, activity, schedule deviation

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Remember that with Via-Móvil, for only 38 Eur, you can enjoy the same subscription on your mobile, valid for both the Tram and the buses from	Tenerife tram	3/10/2017	Facebook	6	3	26	Public Information, app, photo, fares, discount
TRAVELER ATTENTION! Next week our COMMERCIAL OFFICE OF EXCHANGER will remain CLOSED.	Tenerife tram	3/15/2017	Facebook	7	7	32	Public Information, repairs, inclusion, photo
Starting tomorrow, Friday and until further communication, the Tenerife Tram activates the automatic opening of tram doors at all stops, to facilitate the entry and exit of customers, and without having to press the opening button.	Tenerife tram	12/3/2020	Facebook	1500	69	383	Public Information, coronavirus, measure, new
We recall that as of Tuesday, March 17, payment in cash in the buses of	Tenerife tram	3/14/2020	Facebook	6	1	8	Public Information, photo, coronavirus
Do you want to know in real time, from home or work, how long until the next trams pass by your stop? ...	Tenerife tram	8/4/2020	Facebook	4	3	24	Public Information, app, photo
Traveler, remember that we are still in a state of health alarm, but if you have to go to work here are a series of tips from the Ministry of Health that can help you:	Tenerife tram	4/13/2020	Facebook	16	19	38	Public Information, coronavirus, video
Use public transport responsibly and only for essential and justified trips.	Tenerife tram	4/15/2020	Facebook	fifteen	39	53	Public Information, coronavirus, photo

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<p>have not you still participate in our contest? Six of our followers will be able to try a driving simulator and have an almost real experience. Hurry up, participation is open until 1:00 p.m. tomorrow!</p>	Madrid subway	1/30/2014	Facebook	14	10	39	Public Information, raffle
<p>The photo that we leave you here today is from approximately 40 years ago, in it you can see how automatic vending machines have evolved. The first ten were installed at Metro in 1970 to support manual vending. Currently our network has 1,434 machines that are responsible for collecting almost 90% of the total collection. The way of selling tickets on the Metro network has evolved a lot in recent years with the introduction of the commercial supervisor model. The figure of the traditional ticket clerk, with its change box and its manual ticket machine, has gradually disappeared with the aim of being closer to users, with which the sale has passed to the METTAs machines (Automatic Transport Tickets), VAPes</p>	Madrid subway	2/3/2014	Facebook	35	2.3	78	Public Information, memories

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(Automatic Electronic Payment Sale), MAVEs (Automatic Foreign Sale Machine) and MARTTP (Public Transport Card Refill Machine)							
Right now we have the visit of the 6 winners of the last contest in which we invited you to drive a train simulator. We hope that the experience will help you get to know the drivers' work better and, above all, enjoy the afternoon with us. In addition, they will see a simulated station and the fire classroom. We love that you are here knowing part of our work!	Madrid subway	6/2/2014	Facebook	7	10	51	Public Information, raffle
Friday 14 is Valentine's Day, we remind you that we have a new design line in our merchandising products that may help you make an original gift !!	Madrid subway	10/2/2014	Facebook	4	1	30	Public Information, shop
This is one of the oldest cars that are conserved in #MetrodeMadrid. It is a classic "Quevedo" type car, manufactured in 1927. It is currently on display at one of the network stations. Could you tell us which one?	Madrid subway	2/13/2014	Facebook	29	59	144	Public Information, memories
A group of magnificent cartoonists recently visited the #metrodemadrid Motor Warehouse to carry out beautiful works like this	Madrid subway	2/17/2014	Facebook	8	3	40	Public Information, photo

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one. You can see some more here: http://goo.gl/4UsOE We love them!							
The Sol station in the 50s.	Madrid subway	10/6/2017	Facebook	0	0	9	Public Information, memories
The White Towers at the Cartagena station.	Madrid subway	10/6/2017	Facebook	3	1	13	Public Information, station
Fancy some croquettes? Find the best of Madrid on the map of	Madrid subway		Facebook	40	17	109	Public Information, city, activity
Green light for the modernization works of the Gran Vía Metro and the underground connection with Puerta del Sol. + Info:	Madrid subway	10/10/2017	Facebook	36	25	394	Public Information, repairs
REMEMBER: Switch to Multi before 11/1, it's free until 10/14:	Madrid subway	11/10/2017	Facebook	39	35	126	Public Information, fares
Beautiful! We love receiving messages of encouragement from our little billboards.	Madrid subway	7/4/2020	Facebook	9	3	112	Public Information, coronavirus
Soon the sun will shine again.	Madrid subway	8/4/2020	Facebook	twent y- on e	4	198	Public Information, coronavirus, hope
How long will the next trains take at the stations closest to you? New functionality in the official Metro app.	Madrid subway	4/15/2020	Facebook	8	3	60	Public Information, station, app, new project
Soon we will enjoy these sunsets again	Madrid subway	4/21/2020	Facebook	49	fift ee n	335	Public Information, city

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New game! Do you know what station is behind this puzzle?	Madrid subway	4/21/2020	Facebook	tw	46	48	Public Information, game, riddle
On Earth Day, we remember that this planet is our home and it is everyone's job to take care of it. We thank you for doing so.	Madrid subway	4/22/2020	Facebook	17	6	152	Public Information, holidays
ATTENTION: This edition is very special. The companies have made a great effort to present their proposals in a very original way.	Madrid subway	4/22/2020	Facebook	3	0	13	Public Information
Metro employees have come together to help the most vulnerable families in Madrid.	Madrid subway	2/5/2020	Facebook	52	7	85	Public Information, charity
the advertising that other companies hire in Metro is managed by JCDecaux after winning the open contest 1/2	Madrid subway	1/30/2014	Twitter	0	0	0	Customer Service, answer
They are reviews and repairs that our staff always attend to and are resolved in a short time. Greetings and good day!	Madrid subway	1/30/2014	Twitter	0	0	0	Customer Service, answer
We periodically review the voice-overs, we send a notice to verify it. All the best.	Madrid subway	1/30/2014	Twitter	0	0	0	Customer Service, answer
thanks and greetings!	Madrid subway	1/30/2014	Twitter	0	0	0	Customer Service, answer
Circulation interrupted on L9 between Estrella and Ibiza, causing an interval of 15 minutes in both directions	Madrid subway	1/30/2014	Twitter	9	1	0	Real-time update, schedule deviation

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As you can see in the info, other spaces will be enabled. You can consult this link http://madrid.org/inforjoven.	Madrid subway		Twitter	1	0	0	Customer service, answer
The 7 best lemon cakes according to tapasmagazine #mueveteentren and try them	Madrid subway		Twitter	6	0	13	Public Information, activity, city
Users of the Public Transport Card rate its usefulness as excellent. Thank you all	Madrid subway	3/14/2017	Twitter	17	17	79	Public Information, achievement
The best kept secrets of Gran Vía, revealed by TimeOutMAD Come and visit it and #mueveteenmetro	Madrid subway		Twitter	7	0	twenty	Public Information, activity, city
We reinforce the service up to 200% in L7 and L5 for the match of	Madrid subway	8/2/2020	Twitter	5	4	25	Public Information, activity
We are looking for Tania and her fiancé! Help us locate them by doing RT ... We will give you an unforgettable surprise!	Madrid subway	10/2/2020	Twitter	35 6	14	371	Public Informaiton, marriage, train
We are celebrating Valentine's Day with the couple who got engaged in Metro. !! Congratulations!!	Madrid subway	2/14/2020	Twitter	32	7	108	Public Informaiton, marriage, train
Order is what the people who work in the El Arenal market ask for traffic	Cuenca Tram	11/15/2014	Twitter	0	0	0	Public Infomation, citizens, opinion
Ing José Merchán Tram project technician explains to children about this means of transport	Cuenca Tram	11/21/2014	Twitter	0	0	0	Public Information, campaign, education, photo

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Visit of the Mobility technicians to the El Arenal market to define alternatives for transit	Cuenca Tram	11/15/2014	Twitter	0	0	0	Public Information, space use
In the marathon of the story there is the Tram stand where you have all the information about the project	Cuenca Tram	8/11/2014	Twitter	0	0	0	Public Informaition
<u>"UNESCO report does not alter tram route" El Mercurio Newspaper - Cuenca Ecuador Via @mercurioec http://elmercurio.com.ec/455828-avila-tranvia-no-tiene-cambio-de-ruta/#.VGYC6Vr0F2l.twitter</u>	Cuenca Tram	11/14/2014	Twitter	1	0	0	Public Information, link newspaper
In Gran Colombia there are 2 pedestrian spaces, they are between Octavio Cordero and Miguel Heredia and between Miguel Vélez and Coronel Tálbot	Cuenca Tram	5/27/2017	Twitter	two	0	0	Public Information
Meeting with the tourism and hotel sector to report on the progress of the work	Cuenca Tram	5/30/2017	Twitter	two	0	two	Public Information, city, advertising, modal service
The intersection of Mariscal Lamar and Hermano Miguel is open to circulation, do not park on the platform	Cuenca Tram	5/28/2017	Twitter	3	0	two	Public Information, photo, campaign, education
All sections and intersections of Mariscal Lamar and Gran Colombia are enabled for vehicular traffic.	Cuenca Tram	5/26/2017	Twitter	3	0	3	Public Information, photo, traffic deviation

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Attention! Today the tram units circulate normally throughout the route. Please respect the platform and all traffic signs. #CuencaResponsable #CuencaUnida	Cuenca Tram	5/17/2020	Twitter	14	3	30	Public Information, photo, campaign, education
We prepare to return! Know the correct use of the mask, which is mandatory in Cuenca. #WeCareTogether #CuencaUnida	Cuenca Tram	5/18/2020	Twitter	4	0	8	Public Information, coronavirus, measures
We take care of each other! This is how the citizen training phase of the Cuenca Tram is completed. The director	Cuenca Tram	5/25/2020	Twitter	31	6	46	Public Information, video, campaign
We take care of each other! With strict compliance with biosafety protocols, the public training of the Tram begins in #Cuenca. Citizen support is essential. #CuencaResponsable #CuencaUnida	Cuenca Tram	5/25/2020	Twitter	5	two	7	Public Information, coronavirus, measures
We take care of each other! Patricio Romero is the first user of the Cuenca Tram in the citizen training phase. This new transport system allows you to go to your workplace. #CuencaResponsable #CuencaUnida	Cuenca Tram	5/25/2020	Twitter	22	8	41	Public Information, photo, press conference
Plan of Calle Baltazara de Calderón, the only section of the route where the tram and a	Cuenca tram	5/12/2014	Facebook	0	0	8	Public Information, photo, map

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vehicle cannot circulate simultaneously.							
Newsletter on the works of the Tram to be executed in January	Cuenca tram	12/30/2014	Facebook	4	two	19	Public Information, photo, press conference
The materials used in the construction of the Cuenca tram platform must meet high quality levels, therefore the tests are constant	Cuenca tram	12/24/2014	Facebook	1	0	twenty-one	Public Information, photo
Permanent socialization in all places that comprise the Cuenca Tram route and at the permanent point of the Civic Square	Cuenca tram	12/17/2014	Facebook	1	0	9	Public Information, photo, repairs
The APS (Ground Feeding) rails that the Tram will use are in Cuenca	Cuenca tram	2/12/2014	Facebook	5	0	93	Public Information, photo, repairs
At this time of school shopping, visit the Historic Center, great discounts and promotions, pedestrian and vehicular access, is normal.	Cuenca tram	8/24/2017	Facebook	9	0	16	Public Information, photo, city, advertising, modal service
School supplies, uniforms, footwear and all the articles for the beginning of classes, are in the Historic Center; many surprises and promotions.	Cuenca tram	8/25/2017	Facebook	19	0	18	Public Information, photo, city, advertising, modal service
Recovered vehicular and pedestrian access in the Historic Center, make your purchases in traditional places, such as the Super Amigo Stationery.	Cuenca tram	8/28/2017	Facebook	10	0	13	Public Information, photo, city, advertising, modal service

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The October 9 Shopping Center is a traditional place in the Historic Center of Cuenca, to do your shopping this season.	Cuenca tram	8/29/2017	Facebook	25	0	28	Public Information, photo, city, advertising, modal service
<u>Looking for backpacks, lunch boxes and more accessories for the school season.</u>	Cuenca tram	1/9/2017	Facebook	7	0	8	Public Information, photo, city, advertising, modal service
The traffic lights in the roundabouts remain in yellow intermittently, when the tram approaches they change to red to prioritize the passage of the unit.	Cuenca tram	2/27/2020	Facebook	7	1	10	Public Information, photo, campaign, education
The traffic lights in the roundabouts remain in yellow intermittently, when the tram approaches they change to red to prioritize the passage of the unit.	Cuenca tram	3/6/2020	Facebook	10	0	18	Public Information, photo, campaign, education
We commemorate the struggle of women for a fair participation within society	Cuenca tram	3/8/2020	Facebook	3	0	12	Public Information, photo, inclusion
We remember that the Tram already has a rate, this week the Cantonal Council defined the rate for this new means of transport.	Cuenca tram	3/8/2020	Facebook	54	68	104	Public Information, photo, fares

A.2. Interviews

Interview with Tranvia de Tenerife

Interviewer: What are the general objectives of the Tenerife Tram?

Interviewee: I will give you a brushstroke of the general objectives of the company. We are a public transport operator and the main objective is to offer a public transport service. We serve in the metropolitan area of Santa Cruz de Tenerife and the lagoon. We are serving 400 thousand citizens. We have a demand of up to 60 thousand passengers per day, saving last year due to the covid issue. As for a public transport operator, that would be. We also have a second leg that is in charge of the railway networks to the south of the Island. It is a large-scale project that is being tried to be carried out. The third leg is the export of knowledge. We are advising the Cuenca tram, in Quito, in Israel, in Morocco. We have also worked on the peninsula. Those are the three legs; operating a service system in Tenerife, new project on the island of Tenerife and offer of technical assistance abroad. Those would be the objectives.

Analysis: 1. Public transport operator, working. 2. Large projects to install a railway network to the south of the island. 3. Knowledge export

Interviewer: Can these goals be displayed on your social media or do your social media have other goals?

Interviewee: I'll tell you. Social networks, what do we use them for? We use social networks with four legs. The first is the issue of customer service. All that is service management. IN the day to day users have doubts, incidents. Before in 2007 it was by phone or via the customer service pages. The networks have opened up an immediate customer service service for us. The second leg is the subject of information. Every time there is a new service, changes, a new bonus, every time we do something like this we report it through social networks. The third leg is commercial advertising. Through the networks we use it to encourage the purchase of the services they offer. Use the app, this new subscription, for those who do not use public transport. I mean sale. The fourth leg is for institutional information. This is where the general objectives of the company come in. We inform users a little about what we do. What countries are we in? It is also complemented with institutional information from the Cabildo de Tenerife (owner of the tram). Every 6 months we conduct a survey of 1,300 users to find out certain aspects of the service and more. Our data indicates that more than 90% are on social media. We have the breakdown of which networks they are in, who follows our profiles, etc. This indicates that we can reach more than 90%. What happen? Not all of our followers are users of the Tram . We have a percentage that we estimate around 60% that are not tram users. The vast majority, more than 95% of our followers are from Tenerife. Although many of them are not users of the Tram . We also address them in our networks. Also for day to day know us, for institutional information.

Analysis: 1. Customer service, together with physical stores and customer service via telephone. 2. Information 2. Commercial advertising; encourage people to use public transport. I mean to sell. 3. Institutional information, communicate the objectives of the company

-Surveys every 6 months, breakdown of people who use social networks is 90%

Interviewer: Do you use different platforms for the 4 legs? Or do they use them equally?

Interviewee: I'll tell you. There are two issues. We enter first social networks on Facebook at the end of 2009. In i Ciamos our route network, we grew. At the local level around 2010-2011 we realized that we had to go to Twitter. And we enter Twitter. The last 2'3 years we entered Instagram due to the progress they presented. From the beginning we have kept YouTube as a library. As for how we use it... they are totally different platforms. Facebook has a very good thing that is that it allows you to explain things in detail, it allows you to write more, the FB user profile is a profile that are people who are not so hooked on networks, it is not so instantaneous. When we publish in networks, the reaction of people on FB can take hours and even days. In terms of customer service, this is channeled almost entirely through Twitter. Tw is an immediate platform . If they ask you here and in a matter of 10 min you have not generated an answer, you are generating a bad reaction. In FB, on the other hand, if we cannot answer instantly, since the complaint is transferred to the respective area and this process takes a little longer, in FB it can take 3-4 hours and users are sometimes surprised by the speed of the answer. In TW if it takes this amount of time, the user does not even remember that three hours ago he wrote that. On Twitter we are sometimes forced to use threads, but we try not to use them and synthesize as much as possible, since threads do not reach as many users. On Facebook, the user will normally read. There is also the famous FB algorithm. FB only shows contents of things that you follow, based on what may be interesting to you. There we always have to look for the algorithm to favor us and favor our content. Until before the pandemic, a strategy we had was at least once a week to generate content that generated reactions from the followers. Let me explain: I can put a photo of how vital the tram is. That will probably generate few reactions . The TNF council asks me to put some institutional information. This content generates few interactions, so the next content will not have as much reach. So the next post is a raffle for tickets to a basketball game for everyone who writes on our profile. This generates a participation that once again improves the position in the face of the FB algorithm. FB will understand that I am someone interesting and will spread my publications. It is important to measure the interest that I am generating to work with the algorithm.

Analysis: Different behavior of users on platforms. Everything is more expeditious on Twitter, while on Facebook there is more time. Character limit is essential in content that is best suited for each platform. Facebook algorithm is necessary to be able to maintain communication with users.

Interviewer: How do you prioritize among the feedbacks which are the most important?

Interviewee: First, we limit the posts we make. We try not to exceed two posts per day. By doing this, we focus on certain topics. Over the years you get to know the trolls. It is already known that, even if you make a good morning publication, they will criticize you. These types of users are not taken into account. The ones we prioritize are not the ones who post something public like the ones who send private messages. Daily privately we can be receiving 30-

40 messages from different people. A person who privately comments on an incident is a person who does not seek notoriety, he seeks a solution. People who privately send situations are valued much more because they are a person who seeks to improve the tram. Be careful, there are people who send it to you in public. If when you read the comment the person insults, uses exaggerated, derogatory terms, we already take a step back. That's the prioritization. We read all the comments. When it comes to answering comments, one thing happens: people don't read.

Analysis: Limit the publications that are made so that they are not diluted among all the others. You get to know, in a small town, people who criticize for everything. More importance to private messages. The public, although not always so, can be to attract attention.

Interviewer: Do you have a database with the most frequent complaints?

Interviewee: Yes we have. And we have an advantage, we treat the networks from the dept. commercial and marketing g . We carry the customer service telephone number and commercial offices. We can group the entries for each site. We keep a record of the different incidents. Incidents are dealt with with the dept. that corresponds. The answer is always given by giving the solution for each department. All incidents, regardless of how they enter, are recorded.

Analysis: Database with all customer service platforms. Complaints are passed to the department with the possibility of execution.

Interviewer: Are there trending topics in networks, are these taken into account when planning public transport?

Interviewee: Every year before the month of October the service is already planned according to festivities. How do we know if it affects the volume of passengers or not. By experience. Depending on the localities, a percentage of attendees who use public transport are known. These activities are planned based on the story.

Analysis: Social networks are not taken into account, the service is planned based on experience.

Interviewer: The last campaign of Paradas con Encanto, what did you want to achieve with that campaign?

Interviewee: It is part of the social character of the tram. It is not to generate profit, although it is also achieved. People are encouraged to go to these areas of interest by public transport.

Analysis: The city's campaign is to encourage people to go to areas of interest by public transport.

Interviewee: Customer service is missing FB because private messages are missing on FB. All these messages are very important because there are many who do not like to appear. This happens mostly on FB. On twitter 6-7 people write privately. At FB 40-50 per day.

Interviewer: Did the new projects give you more importance on FB, why?

Interviewee: That logic is because in new projects it requires detailed explanation. Twitter does not allow that possibility, you can put a link, a link. But a new project requires an explanatory text, this is offered by FB.

Analysis: The raffles on FB are purely by the FB algorithm.

Interviewer: The activities generated more interactions on FB, why?

Interviewee: The activity that generated the most reactions are the wise men. The carnivals are celebrated in downtown Santa Cruz and are the means of transport of the carnival. People tend to share this information a lot since it is important information.

Interviewer: Did the schedules generate more interactions on Twitter?

Interviewee: People search Twitter for quick answers.

Analysis: Twitter for faster information, while on Facebook people look for information of a more recreational nature.

Interviewer: If you had to give recommendations to other PTAs, what would they be?

Interviewee: 1. We see a lot what others do. A very common mistake is to always keep in mind that social networks are not a notice board. It has to generate intercommunication. You have to talk to the followers and users. If the social network becomes a bulletin board, the platform dies. If answered, people interact and attract more people.

2. The operator must listen to what is being said on the networks, but the networks must not direct the operator. Because in the networks one thing is said, not necessarily I have to change. 30 people talking on social networks can generate a noise that makes them fall into the temptation to change something that affects 100,000 people or a million people.

Interview with INCOFER:

Interviewer: What are the general objectives of INCOFER?

Interviewee: INCOFER's primary objective is to provide quality rail transport in the GAM that can be better every day to increase the mobility possibilities of people in the country

Analysis: Efficient public transport to offer a quality service.

Interviewer: does using social networks meet this objective or do the networks have another objective?

Interviewee: The main purpose of social networks is to inform users of the train service about everything that happens with trains, especially on issues with daily operation. But there is a second objective that has to do with institutional work, in which we focus on publishing all the progress that we are having at the project level. At this moment in INCOFER we want to start teaching people that we are on a path of railway modernization. You just bought trains. We are doing a series of projects in relation to the commissioning of these trains and we are also working on other projects not only in the GAM, but we also want to have a presence in the Pacific and increase the presence in Limón. We are using the networks to inform people about these projects. Apart from what I told you at the beginning that INCOFER's day-to-day operation is with the service of its passengers.

Analysis: The main purpose of social networks is to inform users, especially about the modernization process of the services offered.

Interviewer: How do you use FB and TW?

Interviewee: They are very simultaneous, but the difference is that FB I can expand a little more in the text. Twitter limits me a lot despite the thread. It is easier for me to communicate and express myself. People are very lazy and don't like to dig so hard. It communicates the same on all platforms. If we have a delay today, it is communicated on both platforms. On FB with more explanation and on Twitter more condensed.

Analysis: Both social networks are used equally, with the only difference that on Facebook they can be extended more.

Interviewer: Any metrics by which you can see if the objectives are being met?

Interviewee: An annual survey published on SOCIAL NETWORKS is carried out, so that people can answer it. Metrics in themselves only the same ones offered by the different platforms.

Analysis: Surveys are conducted and social media metrics are used.

- Interviewer: How do you want to be perceived? Among the three efficiency categories, an environmentally friendly company or one more mobility option?

Interviewee: An efficient institution, we are working on an electric train project.

Analysis: They focus more on being an efficient institution.

Interviewer: How do you use feedback, do you generate databases?

Interviewee: Costa Rica is super small and the train users are always the same. We already have identified on social networks who are the ones who always write to us, to tell us that a driver was going very fast, that there is a problem on the railroad. We pass on operational issues to the operations office. We read all the comments. We try to answer the majority. We receive many private messages and we value them. When we see that a message is repetitive. We begin to mobilize the message internally until the message reaches the colleagues who have the power of execution so that they can solve. Sometimes we answer trolls depending on the topic. Sometimes they are simply ignored.

Analysis: Only repetitive comments are passed to the corresponding department. Troll comments are sometimes ignored, depending on the topic.

Interviewer: Are trending issues taken into account or not?

Interviewee: At this time we only work at a specific time, in the morning between 5 and x and in the afternoon from 3.30 to 8. We do not work on weekends. Before the covid, they also worked on Saturdays. In certain activities they asked us to collaborate and we collaborated.

Analysis: Extra or popular activities are not taken into account for planning.

Interviewer: Are tourist sites or shops near the stations taken into account?

Interviewee: No, with some activities collaborations are made with the different municipalities so that people go to the activities by train.

Analysis: It is not usually done. Only when collaboration is requested.

-Graphics results:

* the interviewees did not generate comments in this regard, they agreed with the results shown *

Analysis: Data collection was successful. They had nothing to comment on.

Cuenca Tranvia Interview:

Interviewer: General objectives of the Cuenca Tranvia?

Interviewee: Well, I believe that the objectives of the Tranvia have been set in different stages of the project. The first in its conceptualization. Why is a tram being built in the city of Cuenca? What drives this decision to the municipal administration is to clear the corridor with the greatest demand for mobility from congestion and noise issues, improve environmental quality and obviously the way to reduce the number of vehicles that circulated through this corridor, both private and transport. public was the incorporation of a massive transport system that can move the same or greater number of people in a smaller space. In this case, the

capacity of the tram units is greater than each individual transported individually or with the bus system that we had a couple of years ago. That was the main objective in 2012 when the tram was conceptualized. Subsequently, different milestones were marked over time. The first was to build a tramway system by understanding the city with the least possible affections and that obviously in the shortest time the benefits can be noticed. Unfortunately the construction stage was chaotic. A project that was to last 36 months lasted almost 7 years. So that made the communication the relationship between the construction company and the concept of implementation of the tram with the citizenship has been deteriorating with the passage of time. Only in 2019 is the construction phase finished and obviously the approach that is made is with an operator's vision. In this vision, the objective is to have the highest number of passengers in the system. In the conceptualization there were several erroneous hypotheses about the profitability of the tram. 120,000 tickets were calculated per day and over the years it was determined that this number of users was impossible to have. Then, in the hypotheses made by the executing unit, the objective was to start the first year of execution with 39,000 passengers per day. That was the initial objective and from there gradually to reach the sustainability of the system that occurs around 64,000 passengers. It was complicated. Our start of operation was carried out in the middle of the pandemic. We started the commercial operation in May 2020 when we were confined in Cuenca. When we started the commercial operation, we started with mobility restrictions. We had an authorized capacity of 30% occupancy, then we went to 50% and then to 75%. The objective of every operator is to move the largest number of passengers, but unfortunately these pandemic conditions made us adapt to those circumstances of occupation and obviously to a different communication with our users due to the biosecurity regulations that should be implemented in the routes. That in a general context. The objectives of the Tram were different depending on the circumstance.

Analysis: 1) Conceptualization; improve the quality of life and the environment of the city, and improve the use of space. 2) Construction; try to build the project efficiently. 3) Start of operation

Interviewer: What were the objectives of the SRs In 2014 to communicate the conceptualization to users and afterwards?

Interviewee: Well in the construction stage we had two objectives. First visualize the benefits of a project like this; punctuality, accessibility, less travel time. This was focused 20% and 80% on specific data of the work (closing of streets, drinking water that is going to be cut off, basic services that were going to be affected by the construction). Then it was mutating in the year 2017 where we were already clear about the operating model that the tram was going to have. We move on to the concept of operation. Towards profits and trying to conquer our citizens. Because from 2013 to 2017 there were 4 years in which the citizen suffered a lot in the construction stage. And we have to conquer the citizens. In 2017 our objective was to turn the construction concept towards the operation concept. There, that stage was also greatly extended from 2017 to 2020, which was put into operation. We communicated benefits, road safety, but we also did not have such a strong message about operation, because we did not have that clear figure of how the system was going to operate. Until we had a technical advisor

in the operation and from there we began to take much firmer steps on the way to the operation.

Interviewer: ¿ Y e n 2020 when put into operation?

Interviewee: Communicating times, frequencies, biosecurity, distance, disinfection, that was the communication that we gave to the citizenship i a. Road safety was a concept that we have always given and the benefits.

Analysis: In the construction stage -> visualize the benefits of the project. Then, once the operating model is defined -> attract the largest number of citizens. Finally, in the operation -> Communicate

Interviewer: Were FB and Twitter used simultaneously?

Interviewee: Until mid-2020 they were the same goals on both platforms. When we start Twitter commercial service we use it as a more direct message. IF there is damage to a unit or a service being affected. Twitter is more effective for that direct communication of news while the FB user wants to see other things on social networks. We have used Twitter for this daily communication to publicize what is happening in the system. FB we have used it for road safety and benefits.

Analysis: Same objectives on both platforms until the system began to operate. Twitter was used for more direct communication. Facebook for road safety and communicate benefits.

Interviewer: What was the change due to?

Interviewee: Due to the commercial operation and also due to the reactions of our followers, it was different on Fb and on Twitter. On FB they wanted to see more informational communication topics while on Twitter they wanted to see direct communication of what was happening

Analysis: Attention was paid to the use and the use of the different platforms was improved. As the agency changed, so did the uses of the networks.

Interviewer: Were people's feedback taken into account when planning public transport?

Interviewee: We have an incident survey system. The totems of the stops where users reflect any anomaly in the system, the other the personalization points of the cards and social networks. Any incident that there is, we take it from the social network and we follow up. Although we do not respond transparently to everyone, we make direct contact with the citizen and follow up so that this information is channeled. We have to close the communication circle. If there is a complaint (eg that the card does not work) we do the internal follow-up and we give you a solution. All communications are read and enter the incident survey circle until a satisfactory response is generated to the citizen.

Analysis: The feedbacks of the different customer service platforms are taken into account. All are read and all comments are responded to. Personalized contact is made if necessary.

Interviewer: How were the comments prioritized?

Interviewee: They all have the same treatment. What was done recently was to create an answer manual. There are some that are much simpler answers that can be generated automatically and others that, due to their particularity, carry a certain analysis. In January and February we take that time to categorize the communications and, according to these, give them a differentiated follow-up. Before, they were all treated the same

Analysis: It is not prioritized. An automated answer manual was created.

Interviewee: Did you use a database for feedback?

Interviewee: If we have a database with all the claims. From there, follow-ups are made, for example, if the same user is having many effects, a different follow-up is given. Another issue that was incorporated was response times. Response times and incident resolution times are being measured.

Analysis: Response times were incorporated.

Interviewer: How did you use the activities and trending topics on social media?

Interviewee: We put forward an operational plan. In this certain festive dates are incorporated. These dates are given a different operation. We are adapting to these conditions of each festive date. We also have to communicate changes of routes, for example, due to demonstrations.

Analysis: Social networks are not taken into account.

Interviewer: And the trending topics?

Interviewee: We have a problem. Being part of the municipal government, we have to communicate operator issues and government issues. That is confusing for our user and our follower. Institutional communications absorb more than operations communications. The essence of our network and the content that our user needs is lost. Trending topics has not been a mechanism that has been applied. There have been campaigns like the #vemos that we launched to start the operation, but it has not been a very exploited dynamic by us.

Analysis: Trending topics are not taken into account either

Interviewer: What was the advertising to the stores due to?

Interviewed: In 2017 and it was as part of a compensation for the effects that the businesses that were along the tram route had to mitigate the effects that they had in the construction stage.

Analysis: The "advertising" category is due to compensation to the stores affected by the construction of the tram

Interviewer: If you had to give recommendations to other public transport agencies to use social networks, what would they be?

Interviewee: 1. Credibility is essential in any communication process. Complex issue that we have had to solve over time, because communication has to be hand in hand with what is happening in reality. That effectiveness of monitoring content must be reflected in that ... what we communicate in networks has to be reflected in the real experience of the citizen. That has strengthened us over time. Once we started the commercial operation stage, citizens began to believe in us and to follow our content more. I recommend not losing the credibility of the user and being very transparent in the communication that is handled.

2. As an apprenticeship, before we tried to communicate a lot, but when we communicate a lot we are ineffective. I think we have to focus on more organized communication. Have communication milestones with a maximum of three topics and that with that everything that is published is not diluted, but rather it is reinforced. As we communicate so much, no topic is impregnated in the consciousness of our user. But always with the same goal

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