

## **Certifications related to road safety in automotive passenger transport companies**

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### **ABSTRACT**

The ISO 39001 and IRAM 3810 standards are risk management tools related to road safety. The first establishes requirements for a management system, while the second establishes requirements for good practices. Both are for implementing, auditing and certifying in organizations. In the present work, the situation of certifications of both standards in automotive passenger transport companies in Salta city, Argentina, is analyzed. In turn, the perception of the community in relation to road safety and bus service is identified. Through interviews with representatives of bus companies and through a community survey, the necessary data is obtained. The study shows that all companies certified IRAM 3810. Most did so in 2022, so it is a recent process. The perception of the community partially recognizes the improvements in the bus services, but does not recognize a safe driving in accordance with the road safety rules.

**Keywords:** road safety, risk management, certification, public transport.

## **1 INTRODUCTION**

### **1.1 ROAD SAFETY AND MANAGEMENT STANDARDS**

Unfortunately, around 1,35 million fatalities due to traffic accidents occur each year (World Health Organization, 2018). These accidents are due to various factors, including those related to the design and condition of the vehicles, the road infrastructure and, above all, the behavior of the drivers (Evens 2004; Lenka et al, 2016; Janstrup, 2017). In order to promote road safety as a political priority, the United Nations presented the Global Plan for the Decade of Action for Road Safety 2011-2020, where the objective is to halve the number of deaths from traffic accidents (United Nations, 2010). It also promotes road safety among the Sustainable Development Goals (SDGs): SDG 3.6 establishes reducing deaths by half; SDG 11.2 mentions that everyone should have access to safe, affordable, accessible, sustainable transport systems and improved road safety by 2030 (United Nations, 2020).

Among the tools to contribute to the improvement of road safety, are management standards. The most recognized worldwide the ISO 39001 standard, for road safety management system; it is a generic standard that establishes requirements for management system (ISO, 2012), but does not establish specific requirements for drivers or vehicles. In Spain, the CSEAA model allows evaluating the safety management of bus companies establishing specific requirements for vehicles, drivers and other factors. At the same time, it proposes specific indicators (Izquierdo et al, 2018). In Argentina, the Argentine Institute for standardization (IRAM) has issued the IRAM 3810 standard for good practices for automotive Passenger transport. This standard, updated in 2021, establishes road safety requirements, including for drivers and vehicles (IRAM, 2021; Tarcaya et al, 2018); is a voluntary and certifiable standard. However, the resolution 669/16 establishes for the service companies of passenger transport, the obligation of the implementation of a management system according to the IRAM 3810 standard or another internationally recognized standard on road safety.

## 1.2 OBJECTIVE AND METHODOLOGY

The present work has the purpose of analyzing the situation of the bus companies of the city of Salta, with respect to the certifications according to IRAM 3810 or ISO 39001. In turn, it has the purpose of identifying the perception of the community in relation to road safety. It is a descriptive work, based on documentary research and field research. In the documentary phase, first, antecedent of investigations on the subject of this work were analyzed. The field research was based on data collection and interviews with public transport companies in the city of Salta. To identify the perception of the community, a survey was carried out, using Google Form, with closed questions. The results are presented in statistical tables. The paper ends with conclusions and references.

## 1.3 CASE STUDY: PASSENGER TRANSPORT IN THE CITY OF SALTA

The city of Salta, capital of the homonymous province, is located in the northwest of the Argentine Republic, and concentrates 44% of the provincial population. It constitutes the center of the so-called metropolitan area with 536.113 inhabitants (INDEC, 2010). Its population has grown by 46% in a period of 19 years. The Salta Metropolitan Area is made up of four departments, which includes eight municipalities. The public transport service is provided through a private state-owned company that unifies the management of the contracted companies for 8 corridors. It operates the 49 lines of the route network that cross the metropolitan area. The service operations include a fleet of 618 units (1,2 units per 100.000 inhabitants) with an average urban frequency in peak time of 7 minutes between bus units, which carry 650.000 passengers per day and more than 183 million per year (Arenas et al, 2016; Tarcaya et al, 2021).

## 2 DEVELOPMENT AND RESULTS

### 2.1 SITUATION OF SECURITY VIAL CERTIFICATIONS

Through consultation at Argentinian Institute of Standardization (IRAM), the number of certifications on the country was obtained (IRAM 2023), which is presented in Table 1.

Table 1 – ISO 39001 and IRAM 3810 certifications in Argentina

Standard	ISO 39001	IRAM 3810
Number of certifications	52	137

Source: IRAM. (2023). Interview with an IRAM referent, about the IRAM 3810 and ISO 39001 certifications. Interviewer: Héctor Rubén Tarcaya. Date: February 2023.

The data shows the trend that IRAM 3810 is the most chosen standard in terms of regarding road safety.

Referents of the 7 passenger transport service companies that operate the 8 corridors of the city of Salta were interviewed (Transportation companies, 2023). In all cases, they certified the IRAM 3810 standard. Table 2 summarizes data on corridors, fleet, certified standard and the corresponding year of certification.

Table 2 - Standard and year of certification in the corridors of the city of Salta

Corridor	Fleet	Certified Standard	Certification year
1	41	IRAM 3810	2022
2	109	IRAM 3810	2019
3	58	IRAM 3810	2019
4 y 6	143	IRAM 3810	2022
5	101	IRAM 3810	2022
7	105	IRAM 3810	2017
8	61	IRAM 3810	2022

Source: Transportation Companies (2023). Interviews with referents of the 7 automotive transport companies of passengers. Salta. Interviewer: Héctor Rubén Tarcaya. Date: February 2023.

100% of the passenger transport service companies in the city of Salta, with a total of 618 units have “good road safety practices” certification. There are no ISO 39001 certifications in the city of Salta. Of the 7 companies, 4 achieved certifications in 2022, so it is a recent process.

They were also asked about the difficulty in implementing the specific requirements, which were grouped into: a) organization and management system, b) facilities, c) drivers, d) buses, e) service. In this regard, the interviewees agreed that, depending on the available resources, it was more difficult for them to implement the requirements related to buses, and to a lesser extent, those of drivers. The requirements for facilities, services, organization and management system were not difficult.

Regarding the benefits of certifying IRAM 3810, the interviewees agreed in compliance with the Legislation, the awareness and contribution to road safety, as well as to the reduction of accidents.

The data collected shows that the government and companies have implemented actions to contribute to road safety and reduce the number of traffic accidents. However, it results from interest to analyze if the community has perceived the result of these actions to improve road safety in collective passenger transport in the city of Salta. It is because of that it is analyzed in the next point.

## 2.2 COMMUNITY PERCEPTION

The social perception of road safety has been studied in several times from surveys (Espinosa Molina et al, 2011; Fanai et al, 2022). For the present study, the survey with 5 closed questions was designed. The Binomial distribution with an approximation to the Normal is used to calculate the necessary sample size. A confidence level of 95% is pre-established, with which a minimum statical size of 96 surveys was obtained to have acceptable results free of bias. The established consultation modality is via the Internet, using Google Forms.

The diffusion was made by students of the Faculty of Engineering of the National University of Salta. The study population is people over 18 years old, residents in the city of Salta. The sampling was in February 2023.

207 responses were obtained, distributed in the 3 age groups shown in Table 3.

Table 3 - Responses according to age groups

Age group (year)	Number of responses	Percentage
18 - 30	75	36 %
31 - 50	59	29 %
> 50	73	35 %

Source: Survey: Social perception of road safety (2023). Salta. Interviewer: Héctor Rubén Tarcaya. Date: February 2023.

The detail of the 5 questions is as follows:

- What type of vehicle is the most involved in traffic accidents in the city of Salta?
- What is the main cause of traffic accidents?
- How is the state of the buses in the city of Salta?
- Is the driving of the buses carried out according to the road safety rules?
- In the last two years, has the bus service improved in terms of road safety?

Tables 4, 5, 6, 7 and 8 show the results of each of the questions mentioned.

Table 4 - Perception of the type of vehicle that most participates in accidents

Vehicle type	Number of responses	Percentage
Motorcycle and bicycle	141	68,1 %
Private cars	43	20,8 %
Taxis	13	6,3 %
Buses	9	4,3 %
Trucks and other load vehicles	1	0,5 %

Source: Survey: Social perception of road safety (2023). Salta. Interviewer: Héctor Rubén Tarcaya. Date: February 2023.

Table 5 - Perception of the main cause of traffic accidents

Accident cause	Number of responses	Percentage
Sudden and reckless maneuvers	82	39,6 %
Drunk drivers	31	15 %
Speeding	26	12,6 %
Distractions	21	10,1 %
Awful street conditions	16	7,7 %
Lack of control by the authorities	14	6,8 %
Collapsed capacity in street and avenues	5	2,5 %
Mechanical failures of vehicles	4	1,9 %
Lack of traffic lights and road signs	4	1,9 %
Crossing red lights	4	1,9 %

Source: Survey: Social perception of road safety (2023). Salta. Interviewer: Héctor Rubén Tarcaya. Date: February 2023.

Table 6 - Perception of the state of buses in the city of Salta

State of buses	Number of responses	Percentage
Yes, they are in safe conditions to circulate	130	63 %
No, they are not in safe conditions to circulate	77	37 %

Source: Survey: Social perception of road safety (2023). Salta. Interviewer: Héctor Rubén Tarcaya. Date: February 2023.

Table 7 - Perception of driving buses according to traffic rules

Bus driving according to the rules of road safety	Number of responses	Percentage
Yes	52	25 %
No	155	75 %

Source: Survey: Social perception of road safety (2023). Salta. Interviewer: Héctor Rubén Tarcaya. Date: February 2023.

Table 8 - Perception on improvement of the bus service in road safety

Improvement of the service buses in road safety	Number of responses	Percentage
It has improved	82	40 %
It has not improved	125	60 %

Source: Survey: Social perception of road safety (2023). Salta. Interviewer: Héctor Rubén Tarcaya. Date: February 2023.

The results show that 68,1% of those surveyed have the perception that "motorbikes and bicycles" are the vehicles that are most involved in traffic accidents. Public passenger transport vehicles (buses and taxis) are practically not identified with a large participation in accidents.

The main causes of accidents are related to the behavior of drivers: sudden and reckless maneuvers (39,6%), drunk drivers (15%), speeding (12,6%) and distractions (10,1%).

63% of those surveyed believe that the buses are in safe conditions to circulate.

Regarding bus driving, 75% believe that is not carried out according to road safety rules. Only 40% of those surveyed acknowledge that, in the last 2 years, the bus service has improved in terms of road safety; the remaining 60% believe that it has not improved.

### 3 CONCLUSIONS

The work shows the situation of certifications related to road safety, in the bus companies of the city of Salta, with the limitations and the availability of data and information at the time of doing so. 100% of the bus service belongs to companies certified in good road safety practices according to the IRAM

3810 standard. None company opted for ISO 39001. As of a recent process, there is still not enough specific data on the evolution and improvement road safety.

The legislation that establishes the obligation of implement standards of road safety management and the certifications achieved in 100% of the corridors, shows actions of the authority and companies to improve road safety.

The perception of the community recognizes that the buses are in safe conditions to circulate, and they are practically not identified as participants in the accidents. However, a great majority believes that bus driving is not carried out in accordance with road safety rules; and only 40% of those surveyed acknowledge that, in the last 2 years, the bus service has improved in terms of road safety.

Although the work does not analyzer the evolution of the number of accidents and fatalities where buses are involved, this and other limitations will be the subject of future research.

This work is a starting point for research that complements it, whit the aim of contributing to the improvement of road safety, and the management and reduction of accident risks. This, in turn, contributes to the sustainable development goals of the 2030 Agenda.

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