

# Strategic Road Safety Plan by the company L&S Executive and tourism transport

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**ABSTRACT:** This article aims to show the role that road safety plays within society and how it has become a challenge for public health. Concern has increased because the number of fatalities continues to grow and the terrible accidents continue to advance over time. L&S executive and tourism transportation, a private company located in the city of Bogotá, understood the importance and committed to raising awareness as a private actor. In a first diagnosis, the lack of compliance with the plans by the company is evident. The main objective of this research is to present the necessary tools to comply with the corresponding requirements and standards. It involves its employees and passengers in the implementation of the Strategic Road Safety Plan. It perceived as the opportunity to improve management and quality processes; it will account for the possible risks and limitations. The steps to follow from the method will be listed. This strategy expected to encourage the increase of these processes and be a possible guide for improving road safety.

**KEYWORDS:** Road safety, strategy, structure, social policy, tools.

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## I. Introducción

The accelerated population development and expansion of large cities has exposed gaps in public planning around the world. Concern has increased, as some too many gaps that have expanded at the same speed at which the population grows. There are many questions such as mental health, low birth rate, pandemics, etc. However, there is a very great difficulty in the metropolises, road safety, already considered a public health problem. The WHO has taken measures worldwide to address this challenge and Colombia is no exception. According to the studies presented by the observatory of the national road safety agency corresponding to the year 2021, 7,270 people died in the country due to traffic accidents, exceeding the figures from the previous year. According to the figures, the most affected were motorcyclists followed by pedestrians. The challenge of reducing these statistics is included in the National Development Plan that aims to reduce fatalities by 21%, that is the reason why the Strategic Road Safety Plan (PESV) was implemented “A management tool, which contains the actions, mechanisms, strategies and measures for planning, implementation, monitoring and improvement that the different entities, organizations or companies in the public or private sector must contribute” [1]. This strategy, although it aims to cover the entire country, given the seriousness of the issue, as a priority it focuses on the 10 main departments of the country (Valle del Cauca, Antioquia, Cundinamarca, Tolima, Meta, Cauca, Cesar, Santander, Norte de Santander and Casanare).

Since 1995, the National Institute of Legal Medicine and Forensic Sciences corresponding to the abbreviation (INMLCF) has been organizing the Epidemiological Surveillance System for Injuries due to External Causes corresponding to the abbreviation (SIVELCE) in which all, the factors that are related are recorded. Directly with the forensic medical system. In summary, it tracks deaths completely, those that did not occur due to natural causes, but rather were caused by one or more external circumstances, for example, homicide, suicide, accidental deaths, domestic violence, sexual violence, and traffic accidents. [2]. Thanks to the implementation of this system, formal statistics and concrete data on road safety are now available every year.

In the most recent Forensics available to the public, similar to the year 2020, it is evident that the National Institute of Legal Medicine carried out 5,671 autopsies for deaths in traffic accidents; likewise, 14,459 injuries assessed for this same cause. The majority correspond to motorcycle drivers identified as male. Between it's the period 2011 - 2020, mortality due to these accidents had an average of 13.43%; in the injured, there was a small decrease thanks to the mobility restrictions taken in response to the health emergency. In the age, range where death is most prevalent is between 20 and 40 years, a figure that linked to studies carried out by the WHO, which is why insurance policies are more expensive for people who are within of said range. In addition, it concludes that the motorcycle is the vehicle most involved in fatal traffic accidents and minor injuries. They occur more regularly in single men with secondary education [3].

In terms of accident rates, an increase of 13% observed in the country's capital compared to previous years. This is one of the cities with the highest number of accidents. It is important to understand that the vehicles that were most affected were motorcycles with 84%, followed by automobiles with 9% and finally, public service and cargo vehicles with 7%; The accident rate remains constant at 13.43%, a behavior predicted by authors such as Carmona in his study on mortality in traffic accidents, which made it clear that the most repetitive cause of mortality is excess speed. In addition, that the increase in motorcycle drivers and owners is directly proportional to the increase in the country's mortality figures [4]. What is saddest to analyze is that.

The age range where the highest accident rate and injuries occur also corresponds to the age range where human beings tend to be most productive; these statistics have not shown major changes, as indicated by the WHO. In the country, the company belonging to the public service Torres y Sandoval allocated resources to complement the studies [5]. The correspondence that exists between the public health problem and economic activities in the public and private sectors is notorious. An accident means, for an economic sector, the loss of one or more productive workdays; for the public health sector, it represents an additional challenge given the saturation of a system that already has few resources [6]; this results in recovery disabilities for the injured

In a broad observation, it is understood that many components that contribute something to this problem, an integrity that depends on things external to government planning, although it does concern it, which generates a greater challenge. It is a set of actions and things that end in a consequence, a domino effect, a perfect gear, in the same way he explained the point, pedestrian safety encompasses not simply the pedestrian walking alone on the street focused on his final destination or road. , this pedestrian depends on the road education of other road actors and his own, on his life experience as a walker and that of the drivers of motorcycles, bicycles, electric scooters, trucks, street vendors, Transmilenio, etc. More road actors will be added over time, as human transportation needs advance even faster. Road safety education understood as the ability to adopt habits that modify their behavior to essential traffic rules and principles to safeguard their own lives and those of others.

Given that road safety education is almost non-existent in the country, in this case, how does it face a problem that above all not only involves public strategic planning or research but also the personal traits of its own inhabitants? That is to say, something that seems to have to do with the life experience and naturalness of each of the citizens now becomes a public health problem that requires investment, time, regulations in public and private companies, massive distribution of information to for the changes to appear.

Arendt stated *"No one can be happy without participating in public happiness, no one can be free without the experience of public freedom, and no one, ultimately, can be happy or free without getting involved and being part of political power"*[9]The public is a permanent construction that always needs another. They are concepts directly proportional to society and politics. Therefore, to achieve individual satisfaction or security, it is necessary to participate in the creation of a conscious society. In this sense, it is necessary to think about the public from something that has a direct effect on another, the agreements established between the public and private world affect the context, which is why it is essential to be in accordance with the agreements, in this case road and pedestrian safety. Because these have direct effects on the quality of life of each of the actors. This is when L&S Executive and Tourism Transport identifies the need to be different regarding its quality and responsibility processes as a road actor.

Since its foundation, it has shown growth, providing four pillars of public transportation such as patients, business, tourism and school. Currently, it has a fleet of four own public transport vehicles and 13 affiliated vehicles (White Plates). Since 2020, the company has had significant growth thanks to the implementation and continuous improvement in the integrated quality management system, satisfying the needs of customers and employees. On the other hand, it seeks to guarantee the safety of people; its objective is to minimize the risks of accidents that may arise during the development of the daily activities that carried out in each of the vehicles.

Considering decree 1252 of 2021 by the Ministry of Transportation *"It corresponds to entities, organizations or companies in the public or private sector. That have a fleet of vehicles greater than ten (10) units, or that hire or manage a staff of drivers, design and implement the Strategic Road Safety Plan and articulate it at the same time with its Occupational Health and Safety Management System – SGSST"*[10]. L&S decides to begin the process, to comply with the standard within a maximum period of one year.

In accordance with the aforementioned and the quality review processes, L&S sees the need to generate its own general Strategic Road Safety Plan, assuming its duty as a road actor in the private sector. It is necessary to establish road awareness measures to avoid accidents or accidents where the lives of clients and/or people are exposed. In the search for this awareness, L&S is committed to ensuring that its personnel understand the importance and put into practice preventive strategies that contribute to the reduction of traffic accidents and the protection of life. This will achieve a series of implementation guidelines to improve road safety specifically in public transport vehicles.

This article presents the tools and correspondence in the triple relationship of road actors (vehicles-road safety-road infrastructure). The importance of the problem, the existing political regulations and the advancement of processes are initially raised, a critical development that encompasses road safety. Finally, a strategy will be proposed that use in private companies that are specifically dedicated to tourism or public transportation.

After reading articles or scientific studies on the subject, L&S begins its process by synthesizing and taking the considerations for the correct functioning in the design of the Strategic Plan whose development aimed at risk reduction and citizen well-being. The synthesis provided the bases and structure that allowed the design and creation of this study [11-12].

## II. Materials And Methods

The research carried out is of a mixed applied type and seeks to ensure that the decisions made in this study are oriented entirely towards the well-being of the workers and clients belonging to L&S. in the city of Bogota. The company's main headquarters is located at Calle 69c #113b- 47 Villa Gladys neighborhood in the town of Engativá. The process begins with making the diagnosis. It is highlight that qualitative research is very useful in the first approaches to the process, it facilitates the vision and it helps to make it more analytical. Subjective interpretations made taking into account each, and every actor in the process. The primary objective for L&S Executive Transportation and Tourism is to develop the Strategic Road Safety Plan. That is why it was essential to establish some steps to meet the design objective. The steps developed will be listed below:

- **Diagnosis:** Under regulation 1565 of 2014, it was evident that L&S did not comply with the standardized PESV evaluation guide for any company belonging to the public or private sector. The diagnosis showed the lack of technical parameters advised by the traffic entities for the optimal development of the Strategic Road Safety Plan and resulted in the lack of indicators regarding the legal requirements. The next step was to prepare or update all the documentation: manuals, procedures, formats and instructions in accordance with the proposed document management.

After the documentary survey, the most important ones to take into account prioritized:

- **Operation card:** Document endorsed by the Ministry of Transportation that allows public service vehicles to operate nationwide. It summarizes the basic information of the vehicles such as; company with which it is affiliated, model, brand, maximum number of passengers, type of vehicle, etc.
- **Driver's resume:** Document provided by the platform (SGT). Stores the most relevant information of all drivers, updating data and profile photo, and license type
- **Policies:** One of the most important factors of operation, they must be certified through an insurer, they achieve the coverage required by the Ministry of Transportation for passenger automotive land service
- **Ownership cards:** Public document that accredits a person as the owner of the vehicle, which in turn contains general and technical information.
- **Vehicle resume:** Contains general vehicle information, SOAT, insurance, policies, mechanical technical inspection, engine number, chassis and license plate

Some factors that do not depend 100% on the company, therefore, it is necessary to analyze the possible risks to mitigate the consequences.

To achieve this objective, the risk matrix created that determines the probability of a danger occurring in the operation of the organization, as seen below:

- **Dangers that drivers face but that do not depend on their behavior:** Poor road conditions, poor signage, sharp curves, poor lighting and rain. Although they do not depend on drivers, training them with the necessary information to create an action plan against these risks would reduce their impact.
- **Dangers that depend on the behavior of drivers:** Handling of electronic objects, lack of maintenance, micro dreams and improper maneuvers, consumption of drugs and/or alcoholic beverages and little knowledge of the trips to made, excess speed.
- **Dangers that depend on external supervision:** Errors in personnel selection, lack of policies, lack of knowledge on the part of members, lack of review of the drivers' history of fines or lawsuits.

Taking into account all these possible dangers and raising awareness about them contributes to better behavior for all parties involved. Next, the qualification and classification presented according to the standard bases and the risk level according to the GTC 45 standard (See tables 1 to 4) [13-14].

**Table 1.** Risk level

Risk level	Risk acceptance	Description
I	Not acceptable	Critical situation
II	Not acceptable or acceptable with specific control	Correct and implement action measures
III	Improvable	Improve present controls
IV	Acceptable	Does not require improvements, but does require follow-up

Source: GTC 45, 2012

**Table 2.** Deficiency level

Deficiency Level	Assessment	Description
Very high	10	There is no risk control
High	6	Little risk control
Half	2	Stable risk control
Low	0	Risk is controlled

Source: GTC 45, 2012

**Table 3.** Exposure level

Exposure Level	Assessment	Description
Very high	4	The risk is continuous
High	3	The risk is frequent
Half	2	The risk is occasional
Low	1	The risk is eventual

Source: GTC 45, 2012

**Table 4.** Consequence level

Consequence Level	Assessment	Description
Mortal	100	Death
Serious	60	Permanent injury
Moderate	25	Temporary injury
Mild	10	Sporadic injuries

Source: GTC 45, 2012

Below, in table 5, an extract of the risk matrix presented that carried out according to the evaluation of the items that affect the road safety system of the company L&S Executive and Tourism Transport.

**Table 5.** Risk matrix

Source: The Authors, 2023

POST	VEHICLE TYPE	TYPE OF DISPLACEMENT	TYPE OF HAZARD	DANGER		RISK ASSESSMENT								
				DESCRIPTION	IMPACT	DEFICIENCY LEVEL	EXPOSURE LEVEL	LEVEL OF PROBABILITY	PROBABILITY	PROBABILITY INTERPRETATION	LEVEL OF CONSEQUENCE	RISK LEVEL	RISK INTERPRETATION	RISK ACCEPTABILITY
Driver	Light vehicle	Specific routes Colombia	Infrastructure	Bad condition of the roads	Serious	6	4	24	96	MUY ALTO	60	5760	I	NO ACEPTABLE
Driver	Light vehicle	Specific routes Colombia	Infrastructure	Sleep Curves	Moderate	2	2	4	8	MEDIO	25	200	II	ACEPTABLE WITH SPECIFIC CONTROL

- **Internal audit plan:** It allows internal control, from the roots, designed by managers to add additional value through continuous and constant improvements. Determine which procedures have a negative influence and present weaknesses. It seeks improvements in the efficiency of the processes carried out by the company that are

part of the structural chain. Under the ISO 19011 – 2018 standard [15]. For the audit processes, the company is committed to training employees and implementing an improvement plan that must be monitored by the person in charge and the allocation of resources for it.

- **Strategic Road Safety Plan Design:** Implement activities that promote the growth of awareness about the risks that arise on the different roads of Bogotá, thus preventing accidents. To achieve this design, it is important not to skip any of the objectives indicated above, so that the requirements imposed by the regulatory entities.

Another important activity is knowledge of the plan and policies, self-care through training is one of the first steps, the massive distribution of information is important after all weaknesses are clear.

Technical evaluations for drivers in the immediacy of the service, promotion or clear disclosure of the dangers they face in the road infrastructure are some of the first considerations to take into account for the design. Now, for the landing of the entire concept and diagnosis, it is recommended to continue the design in this way:

By carrying out a survey of the company's members, it was possible to obtain valuable information about the behaviors that drivers have when having an accident or road mishap, the decisions they make and the resolution of the problems, which measures or factors intervene when acting. It was carried out with 25% of the members, in summary:

- Only 4 of 18 drivers have a driving restriction, which is the use of glasses when driving
- 7 of the 18 claim to have had a traffic incident, but none of them claim to have had any minor or serious injury
- The reactions to any incident are as follows: 6 notify the company, 4 call the insurance, 4 try to reconcile with the counterparty and 4 do not respond
- Of the 18 respondents, 2 always plan their trips with the company, the rest do it themselves
- 7 drivers have an average travel time of 1 to 2 hours; the others spend more than 2 hours on mobilizations
- Regarding the risks they face on the roads, 16 think it is due to the signaling, two think it is due to the poor condition of the roads. These risks can increase according to 5 of them due to recklessness and 13 due to bad behavior of pedestrians, drivers, lack of information and culture

Once the risks have been identified and socialized in the company, action plans were made for each factor such as human, vehicles, infrastructure and attention to possible victims. Next, in tables 6 to 9, the plans generated for the company are shown. [11]

**Table 6. Human behavior action plans**

Item	Danger/Risk	Aim	Actions	Controls
Human behavior	Driving under the influence of intoxication and/or drugs	Avoid accidents due to bad driver behavior	Analyze the behaviors and faults that drivers may present	Train employees on road safety issues to avoid risks
	Microsleep			
	Distractions due to cell phone use			
	Speeding			
	Violating traffic rules			

Source: The Authors, 2023

**Table 7. Vehicle factor action plans**

Item	Danger/Risk	Aim	Actions	Controls
Vehicles Safety	Accidents due to vehicles without preventive maintenance	Avoid road accidents	Preoperational Inspection	Perform pre-operational inspections and preventive maintenance

Source: The Authors, 2023

**Table 8. Safe infrastructure action plans**

Item	Danger/Risk	Aim	Actions	Controls
Secure Infrastructure	Lack of lighting	Determine the most frequent routes to mitigate risks	Identify the risks that may exist on the roads to mitigate the likelihood of accidents due to infrastructure.	Provide feedback and train drivers on the analyzes carried out so that drivers are aware of the risks that can be found on the roads.
	Bad signage on the roads			
	Pedestrians			
	Condition of the roads			

Source: The Authors, 2023

**Table 9.** Action plan for victim care

Item	Danger/Risk	Aim	Actions	Controls
Risk for Attention to Victims	Delay in attention times	Implement safety and attention protocols	Conduct training for the road safety committee	Train drivers in traffic accident care and first aid.
	Bad care procedures			
	Accidents due to external vehicles			

Source: The Authors, 2023

Each action plan must have a work schedule to be able to monitor it and a budget must be generated that includes preventive maintenance, medical examinations, documentation, training, campaigns, insurance, toxicological examinations, etc., in such a way as to guarantee its execution over time.


### III. Results

After the development and due process of the plan; to know if it has been effective or not, in this study, the use of some indicators seems pertinent. These are necessary for the validation of the Strategic Road Plan, the objective where the study is tested and qualified. The analysis carried out taking from two or more data in order to establish an evaluation criterion. Below, the indicators established for the company:

- **Indicator 1. PESV Compliance:** It reflects the knowledge of the aspects that fulfilled in the PESV and those that does not implemented.
- **Indicator 2. Accident rate:** Determines the frequency of accidents that members have had and the reasons why they have happened, demonstrating which aspects must be work on for constant improvement.
- **Indicator 3. Annual comparison:** Allows historical comparison of years to know which parameters are and which have shown a decline.
- **Indicator 4. PESV Learning:** Determines how much knowledge all members have or have acquired about the Strategic Road Safety Plan
- **Indicator 5. Vehicle maintenance:** This indicator takes into account what are the respective maintenances that must be carried out and how frequently
- **Indicator 6. Performance per tour:** It determines the times established by each driver for responsible travel, giving the opportunity to optimize it.

Below is the basic technical sheet use in L&S to generate the indicators, answering the following questions about the measurement process: What, where, how, why, how much and who.

**Table 10.** Technical sheet

	L&S EXECUTIVE TRANSPORTATION AND TOURISM	Code: GG-PESV-001 INDICATORS 1
	QUALITY MANAGEMENT SYSTEM	Version: 01
	QUALITY MANAGEMENT	Date: September 15
	TECHNICAL SHEET OF THE INDICATOR	Page 7 of 7

MACROPROCESS:	Human Resources
PROCESS:	PESV Committee

NAME:	Performance per ride
AIM:	Comply with at least 70% of the established times for improving customer service

INDICATOR FORMULA	UNIT OF MEASUREMENT	NAME OF THE VARIABLES	SOURCE OF INFORMATION
$(\text{No. Km per trip} / \text{No. Total Hours per trip}) \times 100$	Percentage	Km of Travel Total Hours per Trip	Preoperational Forms

MEASUREMENT PERIODICITY	MONTHLY	x	REPORT PERIODICITY	MONTHLY	x
	QUARTERLY			QUARTERLY	
	BIANNUAL			BIANNUAL	
	ANNUAL			ANNUAL	

CONCERNED PARTIES		
SURVEILLANCE AND CONTROL ENTITIES	INSTITUTIONAL	x

Source: The Authors, 2023

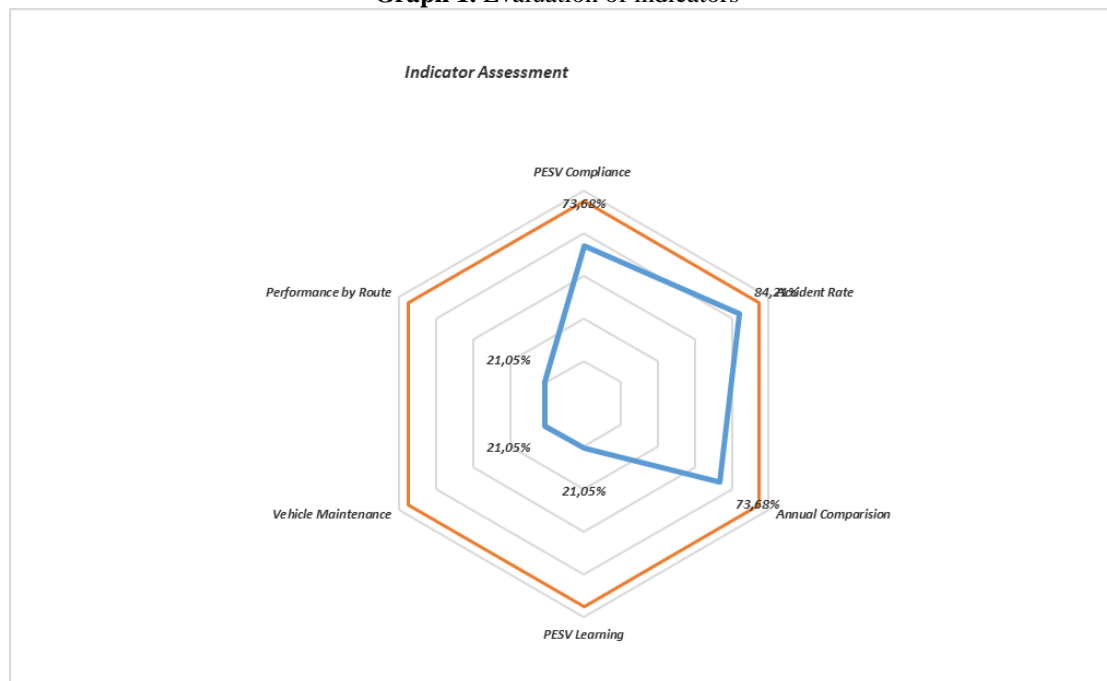
To complement the above, an assessment established expressed through a graph where the aspects that in a lower percentage are observed. Based on the studies presented, action plans taken to reach the expected balance, in this case, 95%. A test carried out to determine whether the results work correctly. Below is Table 11 of the related data and Graph 1 in reference to the assessment obtained.

Table 11. Indicator data

Element	Possible Goal	Score Obtained	% Implementation
PESV Compliance	0,95	0,7	73,68%
Accident Rate	0,95	0,8	84,21%
Annual Comparision	0,95	0,7	73,68%
PESV Learning	0,95	0,2	21,05%
Vehicle Maintenance	0,95	0,2	21,05%
Performance by Route	0,95	0,2	21,05%
<b>Total</b>	<b>6</b>	<b>3</b>	<b>49,12%</b>

Source: The Authors, 2023

Graph 1. Evaluation of indicators



Source: The Authors, 2023

#### IV. Discussion

*L&S Executive and Tourism Transport* adhered to the respective policies. All the steps or completely the standardized method imposed by the entities in charge, within a maximum period of one year, carried out. From the beginning of this study, within the period analyzed, L&S made the effort to use the necessary tools to create an effective Strategic Road Safety Plan, however, during the course in which the necessary actions for this process adhered. The Colombian population increased by 5.6%, which meant more cars, motorcycles, electric skateboards, and trucks traveling on the roads, the total increase was 9%. The mortality rate also did not decrease; its growth reflected by 15%. The ease with which users acquire vehicles in this country, especially motorcycles, increases the vulnerability of citizens to accidents and the causes of injuries and fatal accidents [16] [17]. Although the company took charge of its duties as a road actor, there are factors that limited the investigation, starting because it continues to be in constant change and growth.

Among the gaps revealed by the indicators taken into account in this study are learning by PESV members, vehicle maintenance and performance per trip, all of which obtained the same score of 21% out of 95% (see table.11). According to the Colombian Journal of Occupational Health on the status of strategic road safety plans in the city of Barranquilla [18] [19], although the majority of companies in the individual evaluations achieved a high score in the implementation of these plans. They have the endorsement through the entities in charge to continue operating, many areas of the plans do not fulfilled, this confirmed year after year in the figures collected in Forensis [3].

There is still no business awareness that gives a fundamental role to this plan within occupational health. No company meets all the publicly established requirements, therefore, the greatest challenge centers on the drivers' lack of knowledge of the lines of action. They do not know what to do or how to proceed in the event of a road accident. A very small sample is the assessment table in which it is seen that only 21% of members know the PESV, regardless of the training and the figures provided. Offer as a company.

In an article in which all the literary information on the effectiveness of interventions in road safety is condensed, it is noted that there are factors that remain investigated in depth. The use of seat belts, although it seems like something that drivers are naturally aware of, in developing countries, like Colombia, seems not to be the case [20]. In developed countries, these recommendations are so obvious that they were not taken into account when designing the plan or scientific research. The use of safety helmets on motorcycles, sidewalks for pedestrians, proper use of the cycle path, is far from being obvious for some road actors. As mentioned at the beginning of this study and stated by Hannah Arendt [9], we depend on otherness to be happy, to be free, to respect life. Road safety is a perfect gear, an integrity. It is hoped that the theoretical consequence of this practice will work for future companies or some already founded as a short summary guide on the design of the plan.

## V. Conclusions

Road safety is a shared responsibility. Reducing risk in transit systems requires commitment. L&S Executive and Tourism Transport SAS has assumed, through informed decisions, training, ideal road safety practices, control of factors such as exposure to risk and incidence of accidents, and all good practices of the PESV applied and implemented through the assignment of resources. The commitment of senior management in building safer road awareness.

This research met all its objectives of implementing optimal tools for the design of its own plan. The next investigative challenge is to achieve total compliance with the requirement and improvement in the assessment percentages that were very far from the plan's expectations.

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## References

- [1]. District Secretary of Mobility of Bogotá (PMT), 2022.
- [2]. National Institute of Legal Medicine and Forensic Sciences. Forensis: Data for life. Bogotá: INMLCF; 2006.
- [3]. National Institute of Legal Medicine and Forensic Sciences. Forensis: Data for life. Bogotá: INMLCF; 2020.
- [4]. María A, Cardona S, Arango DC, Yajaira D, Fernández B, Agudelo Martínez A. Mortality in road traffic accidents with older adults in Colombia. *Mortality in road traffic accidents in Colombia Segura AM et al.* 2015;1–7.
- [5]. Torres-Sandoval FA. Determination of unsafe behaviors in bus drivers and their relationship with traffic accidents. *Dyna.* 2017;84(203):263–72.
- [6]. Alarcón JD, Gich Saladich I, Vallejo Cuellar L, Ríos Gallardo AM, Montalvo Arce C, Bonfill Cosp X. Mortality in Colombia traffic accidents. Comparative study with other countries. *Rev Esp Public Health.* 2018;92:1–12.
- [7]. Gómez-Restrepo C, Naranjo-Lujan S, Rondón M, Acosta A, Maldonado P, Arango Villegas C, et al. Latin American Clinical Epidemiology Network Series – Paper 6: The influence of alcohol in traffic accidents and health care costs of it in Bogotá-Colombia. *J Clin Epidemiol.* 2017;86:106–10.
- [8]. Velez-Jaramillo DA, Lugo-Agudelo LH, Cano-Restrepo BC, Castro-García PA, García-García HI. Costs of care and rehabilitation of patients with traffic accident injuries in the world. *Rev Fac Nac Public Health.* 2016;34.
- [9]. Hannah Arendt. *On the Constitution*, Germany, 1988.
- [10]. Republic of Colombia, Ministry of Transportation, Colombia, Decree 1252 of 2021, October 12, 2021.
- [11]. Cerquera-Escobar, Flor Ángela; Pabón-Cachope, Julio Andrés; Fajardo, Ricardo Andrés. Design of a strategic departmental road safety plan (Pilot model for the department of Boyacá). *Faculty of Engineering*, vol. 17, no. 24, 2008, pp. 81-99.
- [12]. Jose Nazif. Practical guide for the design and implementation of comprehensive road safety policies, considering the role of infrastructure. *Economic Commission for Latin America and the Caribbean (ECLAC)*.
- [13]. Colombian technical standard GTC 45, 2012.
- [14]. Díaz, Olga Lucía, & Muñoz Maya, Carlos Mario. (2013). Application of GTC 34 and GTC 45 in an HSEQ services SAS: case study. *Sum of Business*, 4(1), 71-87. Epub March 01, 2021. Retrieved Sept 20, 2023.
- [15]. International Standard ISO 19011. 2018, July.
- [16]. Rodríguez JM, Camelo FA, Ariza LK. Factors associated with the use of motorcycle helmets in two Colombian cities. *Ciênc Saúde Collective.* 2016.
- [17]. Dr. Javier Eslava-Schmalbalch, How to prepare the discussion of a scientific article, National University of Colombia, February 2011.
- [18]. José David Usta-Caicedo, Olga Marcela Díaz-Orozco, Antonio José Pacheco-Molina, *Colombian Journal of Occupational Health*, Jun 2021. [Recovered from]
- [19]. Zuluaga CJA. Evaluation and monitoring of the strategic road safety plan (pesv) in the company Servienergía Ltda, Cereté, Córdoba. Degree work. *Faculty of Engineering, Department of Industrial Engineering: Montería, Córdoba; 2020*
- [20]. Ana M. Novoa, Katherine Pérez, and Carme Borrell, Effectiveness of evidence-based road safety interventions: a literature review, Nov 2009, Barcelona.