



Diagnosis to Identify Security Needs and Technological Solutions for Goods in Transit in The State of Tlaxcala

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Abstract. Today, in a globalized world, the goods distribution and transport sector is present every day in our lives. Users in general need a wide range of services or technological solutions that allow them to have a degree of confidence when moving their goods, implementing the various existing technologies to have greater control in time, cost and security, for this it is necessary to have a tool sophisticated that allows the user to establish the required parameters according to their needs in a system that allows them to choose the various options both in technological products, reach limitations and at the same time the cost of investment with quality and reliable security, as well as You can also opt for economic technologies determining the differences and limitations that these may have with high-end devices. Emphasizing that the user has always defined what he requires, and that the objective of his needs can be covered in a high percentage to determine what type of element can be implemented in the transfer of his goods. That is why this research is carried out to diagnose the security needs of transport companies to design strategies or solutions using the technologies that are available and that in the future will be more developed and improved to meet the demands From the market. Therefore, theft statistics were taken in the state of Tlaxcala and the search for technologies that are focused on security in cargo transportation, to have a series of options for each need.

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1. Introduction:

One of the transportation priorities is safety. Security is a concept that is associated with many perceptions and feelings, which can vary according to the context in which it is used. But it is natural for everyone to seek some degree of security, modern societies have a large number of strategies that seek adequate and reliable levels of security, to carry out all kinds of actions in a harmonious way.

In the business world, when what is at stake can be elements such as the prestige of a company, large sums of money, the supply of elements such as the organization's goods or merchandise for final delivery or to another intermediary, it is vital to have some type of elements that provide security.

The commitment today must be focused on offering a technological and personnel infrastructure that meets all needs. It is not just encouraging clients to save by leasing benefits; it is also to prioritize the security of merchandise shipments with quality, passion, flexibility, integrity, trust and commitment.

2. Theoretical Bases, Analysis and Results:

2.1. Safety concepts

Security (from Latin *Securitas*) on a daily basis can refer to the absence of risk or confidence in something or someone. However, the term can take different meanings depending on the area or field to which it refers in security. In general terms, security is defined as "the welfare state that the human being perceives and enjoys". Arnold Wolfers defines Security in an objective sense, it measures the absence of threats to the acquired values (Wolfers, 1995). Transportation security. Set of measures established to avoid or reduce risks inherent to the transport activity.

2.2. Freight Transport

The transfer of the production of all the goods that are produced in the country is very large, this has a direct impact on the companies that are dedicated to transporting them. As the demands are more and more, having the right technology to satisfy them becomes practically an obligation if the business is to remain competitive and profitable.



Freight transport or freight transport refers to the total movement of goods using land transport in a given network (V., 2017).

The main characteristics of freight transportation are the following:

- I. Transportation is an activity that belongs to the tertiary sector.
- II. Transport objects, materials, animals or people from one place to another.
- III. It uses transport networks to mobilize the products.
- IV. It has a lower cost in the transport service.

2.3. Freight Transportation

Freight transportation in Tlaxcala is a victim of insecurity. Tlaxcala is a small state in central Mexico, east of the country's capital. To the south, the Cacaxtla archaeological site houses colorful frescoes of Mayan origin, while ancient pyramids are found in the nearby ruins of Xochitencatl.

The state borders the states of Puebla to the north, east and south, the State of Mexico to the west and the state of Hidalgo to the northwest.

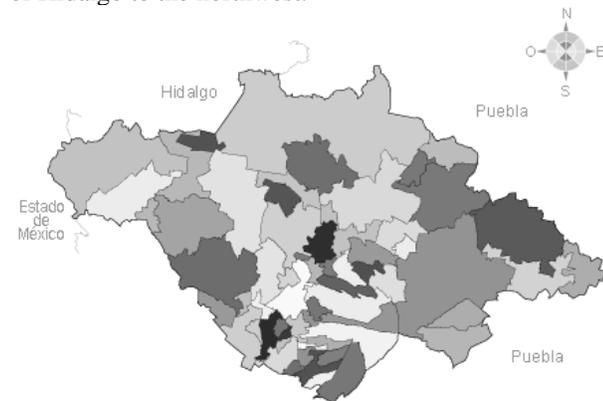


Figure 1. Tlaxcala State.

Source: Excerpted from the National Institute of Statistics and Geography INEGI, 2018.

Theft of freight transportation in Tlaxcala and other states of the country is about to reach its peak. In recent months, a great wave of robberies has been triggered in the freight transport sector.

2.4. Incidents in the transfer of goods.

Goods in transit are assets, merchandise, inventory, raw materials, everything the company can transport or transfer before delivery to the customer or supplier.

Citing data from the National Chamber of Freight Transportation, theft of freight transportation in Tlaxcala increased substantially. According to official data, in 2016 the robbery in Tlaxcala rose 133% compared to 2015. In the first half of this year, 1,354 robberies of cargo transportation were reported in the country. Of that total, 279 robberies were recorded in the state of Tlaxcala. This has had the consequence, among others, that transport

insurance policies have become more expensive up to 200%.

The number of robberies committed on the roads of Mexico rose 14% from 2015 to 2016, according to figures from the National Public Security System (SNSP), which show that the entities with the highest incidence are Tlaxcala and Puebla, in the center from the country. From January to August, throughout the national territory 1,911 crimes of this type were registered, a figure that is equivalent to 7.96 cases per day (Torres, 2016).



Figure 2. Theft incidents.

Source: National Public Security System (SNSP), 2016.

Table 1: Theft from Carriers.

Year	With Violence	No Violence	Total
2012	3124	1307	4431
2013	3698	849	4547
2014	3376	764	4140
2015	3687	763	4450
2016	4725	1183	5908
2017	5047	960	6007

Source: Extracted from the National Institute of Statistics and Geography INEGI, 2017.

Table 2: Highway robbery of cargo trucks.

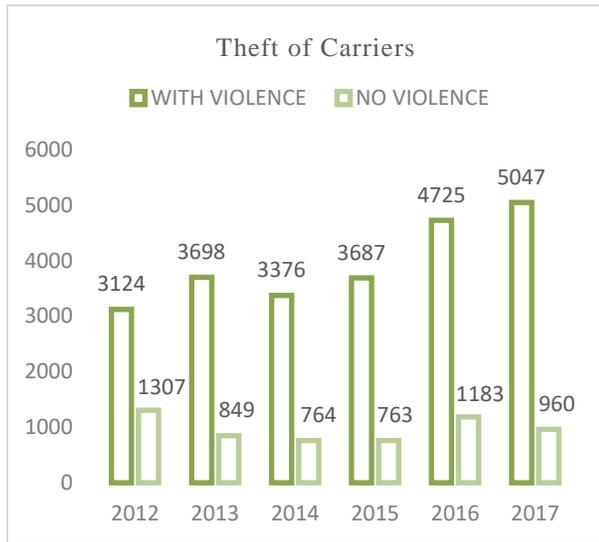
Year	With Violence	No Violence	Total
2012	545	102	647
2013	546	62	608
2014	518	50	568
2015	901	84	985
2016	1489	98	1587
2017	2303	149	2452

Source: Extracted from the National Institute of Statistics and Geography INEGI, 2017.

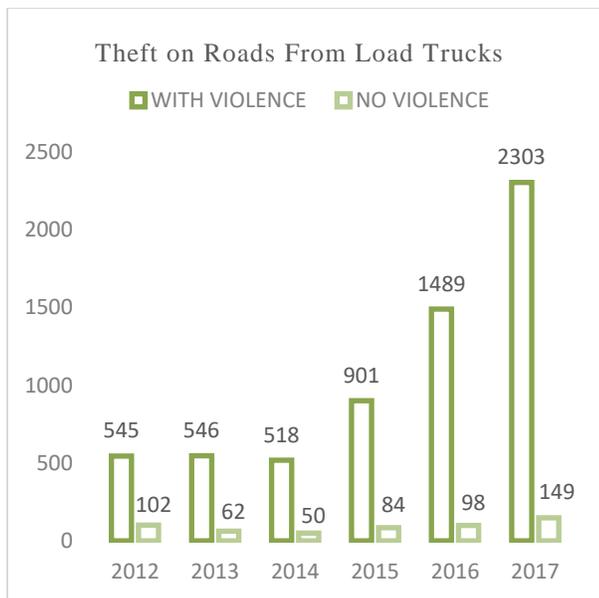
With the information provided by table number 1 and number 2, we can see that the incidents show considerable data, it is a problem that it is feasible to attack



to decrease these values, taking advantage of the use of security technologies.



Graph 1. Comparison of theft from carriers.
Source: Own elaboration, Extracted from INEGI, 2017.



Graph 2. Comparison of highway theft from cargo trucks.
Source: Own elaboration, Extracted from INEGI, 2017.

Given this panorama, it is urgent to resort to practices and tools that help to reduce, considerably, the theft impacts of goods or products, support that a business partner with the technological capacity to meet your needs can provide.

Now let's see the technologies that are most focused on security in the transfer of goods in Table 3.

Table 3: Qualities of technologies for Security

Security Technologies	Reports	Panic button	Geo Routes	Geo Fences	Engine shutdown	Continuous Tracking	Evidence capture	Accessories (Gas Meter)
Security cameras	*					*	*	
Portable GPS	*							
GPS Installed	*	*	*	*	*	*	*	*
Motion sensors	*					*		*
Satellite Platforms	*		*	*			*	

Source: Own elaboration, 2020

All these technologies have a cost, in this study it was observed that, at a higher cost, greater security is why security is an investment.

Each asterisk (*) in Table 3 indicates the characteristics or qualities of each technology and according to the table, the global positioning system is the one that covers most of the needs required in motor transport.

In this sense, motor transport companies must be committed to investing and adding the technologies and solutions available to the industry.

Advantages of traceability and monitoring of freight transport.

Traceability and optimal monitoring within the supply chain process, provide certain advantages in terms of logistics processes related to both shipping and receiving of goods. They are also a great tool regarding logistics and distribution management, as they help to sort the procedures and the management of the goods. Among other traceability advantages, the following could be highlighted:

1. Facilitates better internal control of merchandise.
2. It helps automate the entry of product data.
3. It improves the accessibility of the information.
4. Provides greater control of freight shipments, improving inventory management, providing better service.
5. Increase productivity.

The advantages of applying the GPS and GPRS tracking systems in traceability are the following:

1. Increased business profit and productivity of the fleet.
2. Compliance with legislation on driving times is regulated.
3. Savings in communications.
4. Overtime is reduced.
5. Optimization of times and mileage per vehicle.
6. Improved service and customer satisfaction.



3. Conclusion

In order for a company to expand and have better opportunities in the market, it should always consider having a good investment in its transfer security strategies, better known as logistics.

The improvements must be notable since the application of new technologies today and in the future improve communication, control and security within the management of the transfer of goods.

With the development and application of new technologies, which have been developed and improved in recent years, it has contributed to the improvement of organizational processes in freight companies, as they provide more powerful tools than they provide the obtaining, access, processing and analysis of information, allowing monitoring, planning, forecasting and making decisions with greater precision and speed.

In this sense, traceability in the transport of goods is of vital importance, since it is in charge of monitoring the product throughout the chain of the delivery process, from the time it leaves the supplier company until it reaches the final consumer. Taking into consideration that this is an

important factor for the growth and development of the company, because most sales must have a high degree of security to be able to operate.

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