

# Arequipa's Population Perception in Regard to the Infrastructure of the Avenues Venezuela and Daniel Alcides Carrión

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## Abstract

The present study corresponds to a descriptive research, whose objective seeks to determine the level of satisfaction of the population of Arequipa city, in respect of public works infrastructure executed in the Avenues Venezuela and Daniel Alcides Carrion. We designed a survey questionnaire which was applied to 384 people randomly for convenience, in the areas surrounding the road interchange. The results showed that a 65.10% believed that the infrastructure works had a positive impact, in addition to a 52.86% and 7.29% of people who were satisfied and very satisfied respectively, with the vial exchange carried out in the Avenues Venezuela and Daniel Alcides Carrion.

## Keywords

Public Works, Infrastructure Works, Vial Exchange, Satisfaction, Population

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## 1. Introduction

In the last ten years, Peru has had a sustainable growth in its economy. This is due to economic policies determined by the government, in addition to the momentum and promoting of the private investment. But Arequipa is not an alien to this growth; during the 2013 Arequipa posted growth in Gross Domestic Product of 6% [1], quantity above the national average.

This growth is also reflected in the increment of the population [2], at the end of the 1990s and 2000, appeared in Peru a social aspect called centralism<sup>1</sup>. This is why the government applied a strategy for decentralization, which entailed and generated a regional centralism in the major cities of Peru, Arequipa and Trujillo, that now represent important economic growth. Nowadays Arequipa receives immigrants from different parts from the

<sup>1</sup>Centralism in Peru: economic activity concentrated in the capital Lima.

south of Peru, like Tacna, Moquegua, Cusco and Puno; being approximately one million habitants as we can see in **Table 1**, becoming the region with the highest number of habitants after Lima and Callao.

Arequipa increases their economic growth thanks to the development of different sectors such as mining,

**Table 1.** Projected population to June 2013.

Most Populous Provinces		
Department	Province	Population
Lima	Lima	8,617,314
Prov. Const. del Callao	Prov. Const. del Callao	982,800
<b>Arequipa</b>	<b>Arequipa</b>	<b>947,384</b>
La Libertad	Trujillo	928,388
Lambayeque	Chiclayo	843,445
Piura	Piura	744,659
Loreto	Maynas	554,705
Junín	Huancayo	499,432
Cusco	Cusco	435,114
Ancash	Santa	430,925
Cajamarca	Cajamarca	375,227
Ucayali	Coronel Portillo	370,098
Ica	Ica	353,611
Piura	Sullana	312,307
Tacna	Tacna	307,608
Huánuco	Huánuco	304,487
Lambayeque	Lambayeque	291,006
Puno	San Román	282,043
Ayacucho	Huamanga	266,390
Junín	Satipo	254,488
Puno	Puno	245,925
Lima	Cañete	226,260
Lima	Huaura	215,138
Ica	Chincha	212,643
Cajamarca	Jaen	198,661
Junín	Chanchamayo	196,791
Lima	Huaral	185,076
San Martín	San Martín	181,946
Cusco	La Convención	179,670
Cajamarca	Chota	166,757
Apurímac	Andahuaylas	165,165
Ancash	Huaraz	162,889
Tumbes	Tumbes	161,257

Source: INEI National Institute of Statistics and Informatics.

trade, construction, and services which promote employment generation, economic stability and improvement in the quality of life. Because of this, many citizens took advantage of this “economic boom” to invest in capital good, buying homes, cars, etc. This created serious problems due to the increase of the automotive park [3] (Table 2). The Regional Government and the District Governments had to take the initiative to redesign and rebuild many main roads, to facilitate and decrease the traffic congestion that was reflected by these problems [4].

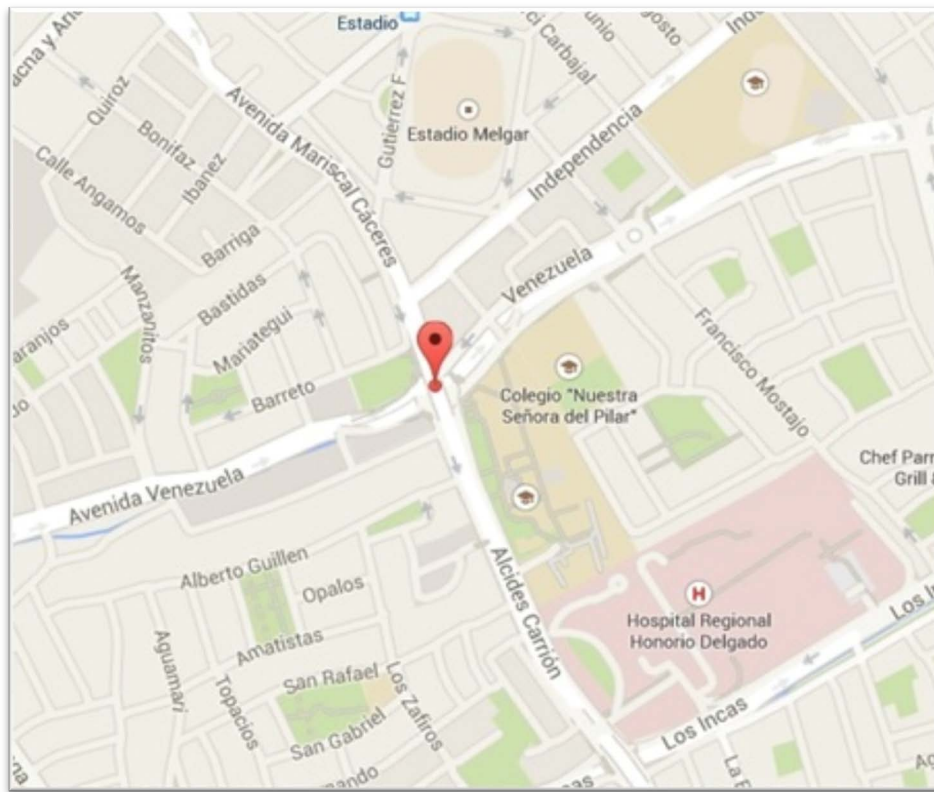
One of the main roads is the vial exchange of the avenues Venezuela and Daniel Alcides Carreon, which are parts of the first road ring in the structure of the Master Plan of Metropolitan Arequipa. This is because both avenues will become a quick way to achieve a fluidity in the vehicular transport and particular mass urban. This vial exchange is located in the Arequipa City, in the following coordinates (16°24'44.1"S, 71°32'07.3"W) as shown in Figure 1.

Venezuela avenue is part of the first ring in the structure of the Master Plan of Metropolitan Arequipa [5]; along it there are already 4 exchanges vials, the same that were built in different periods, and therefore were not planned on a holistic basis. These avenues should already be on the fast track to achieve a fluidity in the vehicular

**Table 2.** Increase in the automotive fleet by departments in units.

Department	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total	1,361,403	1,440,017	1,473,530	1,534,303	1,640,970	1,732,834	1,849,690	1,979,865	2,137,837	2,387,964
Amazonas	1975	2020	2103	2168	2218	2292	2390	2407	2400	2681
Ancash	19,293	19,382	19,757	20,354	21,001	21,309	22,086	23,322	25,418	28,392
Apurímac	3730	3816	3879	3916	3934	3973	3969	3966	4039	4512
Arequipa	78,858	79,544	81,293	84,829	91,674	98,270	106,521	118,985	134,533	150,273
Ayacucho	3882	3919	3969	4153	5404	5572	5716	5784	5941	6636
Cajamarca	8882	9501	10,256	11,255	12,383	13,563	15,107	17,320	19,673	21,975
Cusco	35,342	35,705	36,204	37,592	39,688	42,175	45,090	48,491	53,675	59,955
Huancavelica	1043	1061	1080	1103	1216	1291	1319	1317	1323	1478
Huánuco	10,968	10,886	10,836	10,892	11,255	11,382	11,864	12,576	13,476	15,053
Ica	22,692	22,753	22,834	23,170	25,498	25,691	26,135	26,419	26,551	29,657
Junín	43,468	43,648	44,454	46,091	47,769	49,404	51,094	53,118	56,237	62,817
La Libertad	97,590	153,777	152,847	153,251	155,411	156,646	158,672	162,026	167,325	186,902
Lambayeque	37,967	38,263	38,744	39,930	41,920	43,689	45,881	49,440	53,902	60,209
Lima	866,881	885,636	912,763	957,368	1,036,850	1,106,444	1,195,353	1,287,454	1,395,576	1,558,858
Loreto	5336	5286	5215	5154	5132	5089	5089	5211	5313	5935
Madre de Dios	823	819	827	870	913	941	986	1027	1062	1186
Moquegua	9417	9622	10,394	11,418	12,202	12,692	13,348	14,003	14,608	16,317
Pasco	4772	5232	5514	6075	6807	7187	7351	7292	7238	8085
Piura	31,731	31,734	31,828	32,314	33,497	34,650	36,367	39,099	42,404	47,365
Puno	25,642	25,874	26,452	28,062	29,889	31,645	34,169	37,074	40,543	45,287
San Martín	10,277	10,156	10,033	9969	9917	9977	10,151	10,418	10,926	12,204
Tacna	30,549	31,119	32,011	33,944	35,911	38,457	40,465	42,318	44,430	49,628
Tumbes	2958	3009	3025	3042	3040	3054	3086	3119	3257	3638
Ucayali	7327	7255	7212	7383	7441	7441	7481	7679	7987	8921

Source: MTC Ministry of Transport and Communications.



Source: Google Maps

**Figure 1.** Location Avenues Venezuela and Daniel Alcides Carrion-Satellite Map.

transport and particular mass urban. The oldest one of these exchanges is the av. Venezuela—av. Alcides Carrion, subject of this study and where the “Arequipa Bus” will circulate, along the corridor exclusive of transport.

Venezuela avenue is part of the first ring in the structure of the Master Plan of Metropolitan Arequipa 2002-2015. The sharing road is called “Palomar”. The exchange Palomar was designed in anticipation that the Av. Venezuela becomes, in the future, on a fast track (“zanjón”). It has three levels: an underpass crossing, a bridge—roundabout at the ground level—and another bridge at high altitude for the Exclusive Broker. The work in av. Alcides Carrion—Venezuela is valued at approximately 17 million 347 thousand soles. The municipal authority announced that the three road interchanges would require four months; however, only El Palomar, according to initial studies, would require up to 7 months for its execution.

This research seeks to analyse the perception of the population of the city of Arequipa with respect to the infrastructure works to study, by determining the level of satisfaction of the population as a percentage.

## 2. Methodology

### 2.1. Sample

For the calculation of the sample, it was considered as population the number of units of the fleet in the city of Arequipa to the year 2013<sup>2</sup>, obtaining the sample of 384 persons, who were elected by non-probabilistic methods for convenience. Subsequently we proceeded to identify the person to survey based on the following standards:

- a) Admit only people between 18 and more years, because the questions need to be answered in a mature way and consciously.
- b) Identify places with high turnout of people and that are surrounding the Road Exchange.
- c) Make an affixation of the sample proportional to the size of the total population.
- d) Random distribution for convenience of the places to survey.

We surveyed a total of 384 people, with ages ranging from 18 to 65 years, of both sexes who live in the city of

<sup>2</sup>Presupuesto, M. d.-O. (s.f.). *Ministerio de Transportes y Comunicaciones*. Obtenido de [www.mtc.gob.pe](http://www.mtc.gob.pe)

Arequipa and pass through the interchange road.

## 2.2. Instrument

We made a questionnaire survey, which collects data such as the frequency of transit and-or usage, number of time and to figure out why they use the exchange vial by determining a relation of alternatives:

- a) Work
- b) Recreation
- c) School of their children
- d) Visit a relative/friend
- e) University/Studies
- f) Procedures
- g) Health centers/Clinics
- h) Shopping/Go to a mall
- i) Way of daily use
- j) Others

In addition to determine the level of satisfaction with population, questions were developed using a Likert-type scale, taking as response options on the level of satisfaction:

- a) Very dissatisfied
- b) Dissatisfied
- c) Indifferent
- d) Satisfied
- e) Very satisfied

As the same time, the questionnaire collected data from control as the sex and age of the participants.

## 2.3. Procedure

The process of data collection began with the election of the places and time of interviews, by determining the following places, for convenience:

- a) Market: "El Palomar"
- b) Shopping center "ParqueLambramani"
- c) Shopping center "Mall Aventura Plaza"
- d) National San Agustí University
- e) Hospital: Honorio Delgado
- f) Health center Daniel Alcides Carrión
- g) Av. Salaverry, Instituto del Sur

These locations were selected in order to the following standards:

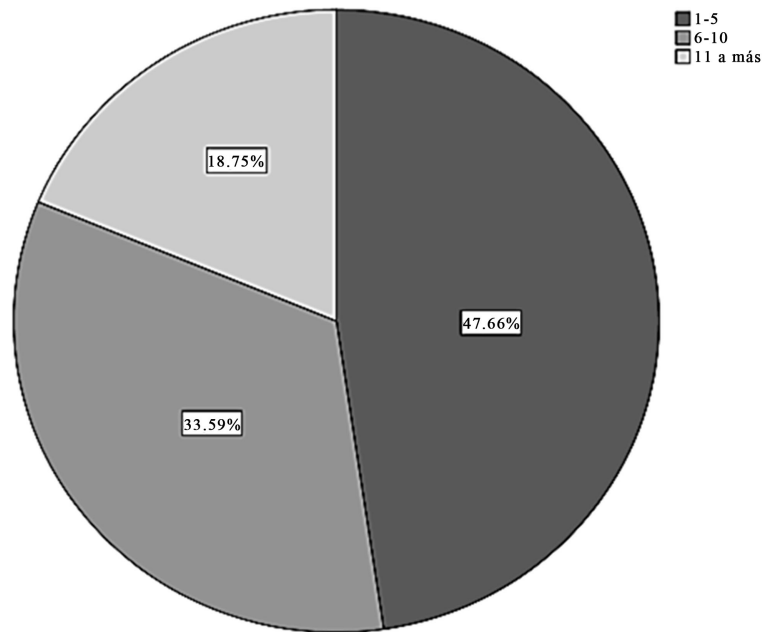
- a) Place with high traffic of people and vehicles
- b) Due to its location, surrounding and close to the Road Exchange.
- c) Because they are public places where you can do the surveys without any problem or inconvenience.

Also an schedule for the interviews was determined considering the hours of highest traffic of people and vehicles, 7:00 am - 9:00 am and 4:00 pm - 7:00 pm. The implementation of the survey was conducted during the month of February of 2014 and lasted approximately 5 minutes and was conducted by 5 staff, trained in interviews and data collection. When the stage of gathering information was completed, the information was processed in the SPSS statistical software, to obtain the results.

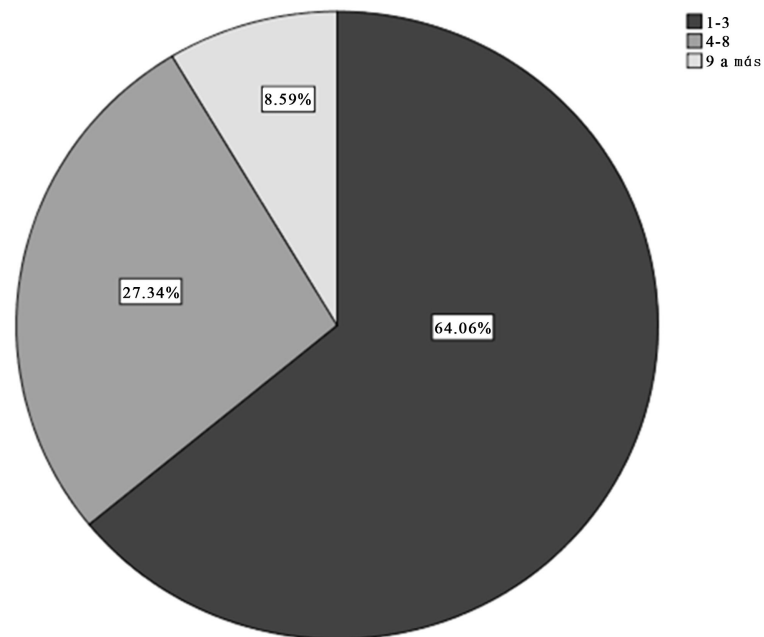
## 3. Results

We surveyed 384 people between the ages of 18 and 65 years, of which 185 are female, representing a 48.2% and 199 are male representing a 51.8%, all of them citizens of Arequipa which often pass through the exchange of the avenues Venezuela and Daniel Alcides Carrión. The frequency of transit and/or use of this exchange vial is quite high as you can see in **Figure 2** and **Figure 3**, a 47.66% of the population passes between 1 to 5 times, from Monday to Friday, while a 64.06% on the weekends.

In order to the reason for which people pass through the interchange road, we can observe that the most salient



**Figure 2.** Frequency of transit of persons from Monday to Friday; How often transits the road interchange, Monday to Friday?



**Figure 3.** Frequency of transit of persons on weekends; How often transits the road interchange, Saturday and Sunday?

and important are: working with a 27.20%, followed by commercial centers 19%, universities or research centers 12.6% and medical centers 8.5% (**Figure 4**).

The perception of the population regarding to the impact of these public works infrastructure in their quality of life, the 65.10% believes that the impact is positive, while only the 14.06% thinks that it is a bad thing, on the other hand a 20.83% is indifferent to the impact or influence generated by this vial exchange (**Figure 5**). Another significant result is the impact on travel times using this fast track, where a significant 69.27% responded that this fast track reduce traveling time from one place to another, on the other hand a 12.76% said that the time has

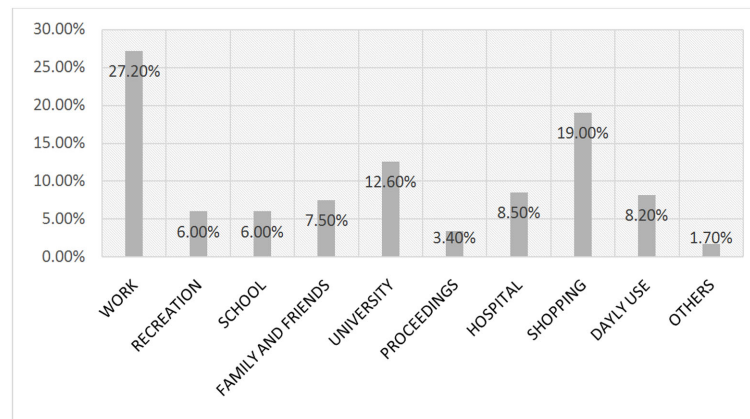


Figure 4. Reasons for using the exchange vial.

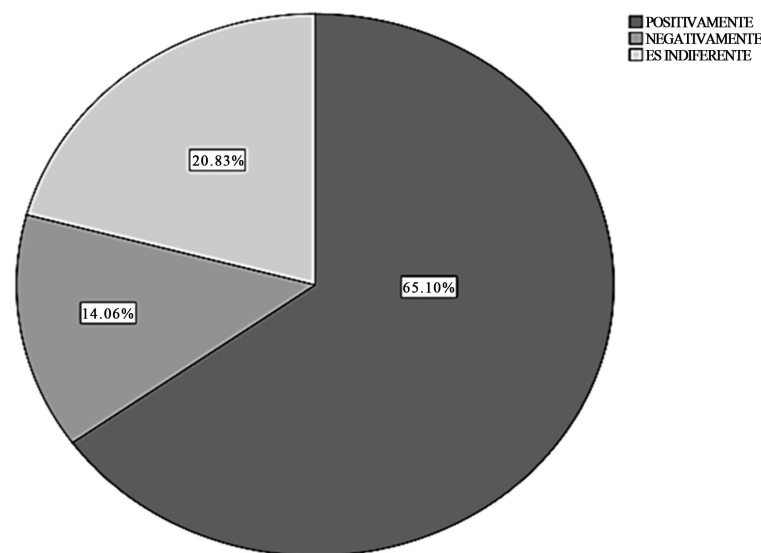


Figure 5. Impact on the quality of life of the exchange vial; How do affects the vial interchange at quality of life?

increase and 17.97% of the remaining population believes that the travel times remained the same (Figure 6).

As the most important result and giving response to the objectives of this study, we discovered that the perception of the population of the city of Arequipa regarding to public works in the exchange vial executed in the avenues Daniel Alcides Carrion and Venezuela is the following: the 52.86% is satisfied and 7.28% felt very satisfied with this infrastructure work. However the is a percentage which is very dissatisfied and unhappy as you can see in Figure 7.

In addition to the descriptive processing, we did a correlational analysis using the test of Kendall Tau-b. The results show that there is a strong correlation between people who frequently travel through the exchange road from Monday to Friday with the people passing on weekends; we can say that they live nearby. Another interesting result that present the study talks about travel times in connection with the satisfaction and subsequent recommendation to use the interchange road, because with lees time for transfer, higher degree of satisfaction, presenting a correlation of  $r = -5.24$  and with less time for transfer, greater recommendation of the service, with a correlation of  $r = -0.431$ . Both results are significant and offer moderate inverse correlations. We can also say that to a greater degree of satisfaction, grater recommendation and when the traffic follow is better, the transfer time decrease, having a correlation of  $r = -0.454$ . To conclude we can say, in order to the results presented, that the degree of satisfaction and the potential recommendation to use the vial exchange are related to several factors, mainly on the fluidity of the traffic and the time to transfer. See Table 3.

#### 4. Discussion

Arequipa is a city with great economic growth, above the average country; however this growth is mainly driven by the private sector. We can see more shopping centers, businesses, factories, industries and mines in the region, which generate employment generating an economic cycle. But this economic growth is not supported by the public sector; we do not have the infrastructure or the support of airports, terminals, ports, roads and avenues to support and collaborate with this economic growth. Therefore we can conclude that while it is true Arequipa is having an economic growth; we are still far from being able to talk about social development.

By observation we can see that the perception of the population in relation to a public works is always negative, before and during the execution of the project, but the results of this study show that once a project is completed, the perception of citizenship is good, demonstrating satisfaction levels quiet high. In conclusion we can say that it is important to invest in access roads to the city of Arequipa and thus contribute to the growth

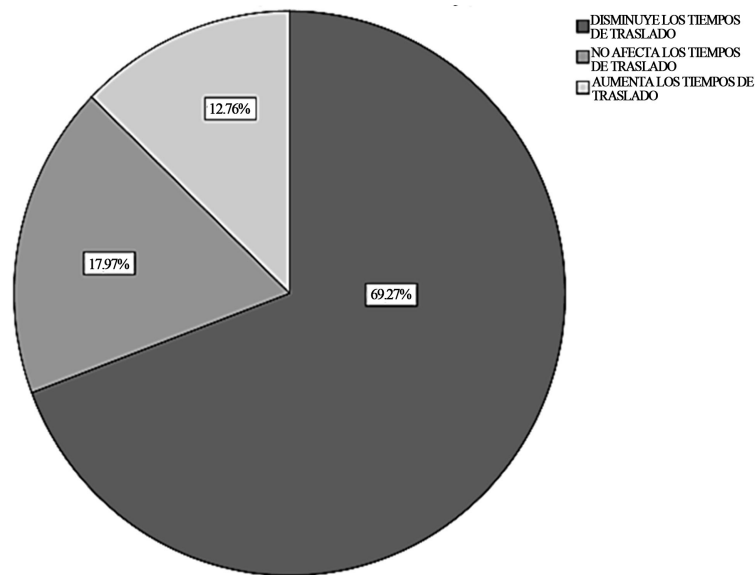


Figure 6. Impact on the travel times of vial exchange; How do affects the vial interchange at travel time?

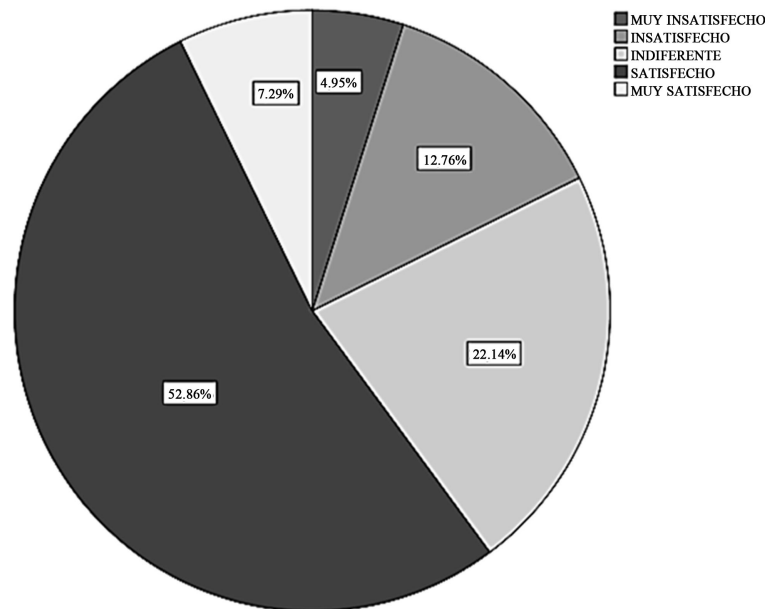


Figure 7. Degree of satisfaction in percentages.



**Table 3.** Correlational analysis.

	Transit frequency Monday to Friday	Transit frequency Saturday and Sunday	Time of Transfer	Level of Satisfaction	Recommend for Use	Lighting	Flow of traffic
Transit frequency Monday to Friday	1.000	0.533**	-0.038	.068	0.089*	0.105*	0.011
Transit frequency Sat- urday and Sunday		1.000	-0.061	0.107*	0.105*	0.012	-0.065
Time of Transfer			1.000	-0.524**	-0.431**	-0.227**	-0.454**
Level of Satisfaction				1.000	0.523**	0.295**	0.427**
Recommend for Use					1.000	0.243**	0.424**
Lighting						1.000	0.266**
Flow of traffic							1.000

\*  $p < 0.05$ ; \*\*  $p > 0.01$ .

and development.

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