

EVALUATION OF COMPLIANCE WITH ROUTE 3 (SAN GABRIEL- GUAYAQUIL) IN THE UNITS OF THE SEÑOR DE LOS MILAGROS TRANSPORTATION COOPERATIVE

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Abstract: The development of the issue evaluation of compliance for route 3 (San Gabriel-Guayaquil and vice versa) in the units of the Señor de los Milagros transport cooperative of the Daule canton, evidenced the current situation of the demand of users who use this route, as well as the characteristics, level of occupation of the units and consequently propose alternatives so that the inhabitants of the San Gabriel compound become permanent users of the operator. In the context, the design of a methodological study was established, based on documentary, field, descriptive and explanatory research, with a mixed approach, using the technique of user promotion and descent ratings, in addition to determining the total number of population of 3,660 people, the same one that served to apply the statistical formula and obtain the sample of 347 people, which were surveyed. Regarding the results of the gauging, it was observed that the route has several sections, which establish ascents and descents whose load factor was 44.13% and 9.27% of users in both directions. In the surveys, the need for a mode of transport that offers a safe and quality service was evidenced. Finally, improvement alternatives were proposed for the provision of the service, which are aimed at complying with the established frequencies, reducing travel and waiting times and improving the attention from the operators.

Keywords: Public transport, capacity, vehicle capacity, load factor.

INTRODUCTION

In Ecuador, interprovincial public passenger transport has become a necessity for users of the different cities of the country; being one of the highest economic income of land transportation, according to the Superintendence of Popular and Solidarity Economy (SEPS, 2016).

Within the Daule canton, the “Señor

de los Milagros” cooperative has provided public passenger transport services in the intraprovincial modality since 1962, currently it has a total of 53 units, of which 95% of its units They are modern, the same ones that have air conditioning and Wi-Fi service, comfortable seats and have seat belts as required by the NTE INEN 2704 standard, motor vehicles(The Universe, 2018).

For the transport operator, it is important to provide users with safe and quality mobility to the different places covered by the route of this route, highlighting among the best-known populated areas that the Guayaquil canton, Satelite urban parish, La Aurora is crossed., Limonal rural parish and the San Gabriel enclosure, within the latter there are approximately 600 families and its geographical location directly influences mobility by land, the same that allows connecting with other geographical points and where several essential activities are carried out. associated with the labor fields, education, commerce, recreation among others that in a compendium revitalize the economy of the sector.

In accordance with the Operation Contract for the provision of the intraprovincial public passenger transport service, in Resolution No. 14 – CRYF – A009 – DPCH-ANT/ Route Concession. Route 3 one way: San Gabriel – Nobol – San José – Petrillo – La Unión – Guayaquil. With approximately 24 frequencies, with an interval of 30 minutes; operating from 5:30 a.m. to 8:00 p.m.

In relation to the fulfillment of the operation contract, several problems arise: The volume of users (passengers on board) is less than the operating expenses of the different units, due to the low occupancy rate of the number of passengers required. Likewise, the level of competition of alternative commercial transport of trikes, motorcycles, trucks, buses that operate irregularly and without any type

of permit or authorization from the competent entities.

METHODOLOGY

The present investigation presents a mixed approach of deductive type as a process that collects, interprets and analyzes quantitative and qualitative data, where the qualitative perception of the actors (users) was used to carry out the observatory record of the problems in the operation of the route. . Regarding the quantitative approach, personal surveys were applied to the inhabitants of the study area and a count of daily users for a week (Monday to Friday and weekends), later the data was quantified, tabulated and represented in tables and figures, using the Excel program. Regarding the type of research, it is field, since the ascent and descent of passengers for the user count was determined by means of a previous format,

Regarding the type of count used and the observation periods, the study of passenger boarding and unloading was considered, in 3 sections, in both directions of the route from 05:05 to 16:45, from Monday to Friday and on weekends. The instruments used in the research project were a questionnaire of specific closed and easy-to-understand questions that allowed us to verify, recognize, give reliability and sustainability to the research. Regarding the population, the results determined that 347 surveys must be carried out.

RESULTS

OCCUPATIONAL FACTOR CAPACITY STUDY: SAN GABRIEL – GUAYAQUIL (ONE WAY)

By gathering each of the results of the study of passenger ascents and descents, it was determined that from 5:05 am to 6:20 am, passenger demand decreases, from 7:05 to 8:45 am it partially increases. From 9:30 am

it begins to increase and decreases from 10:15 to 12:30 am. After 1:30 p.m., the maximum point is evident and drops to 2:30 p.m., with a proportional increase until 4:00 p.m.

When collecting the information, it was established that the maximum occupancy factor is 243.18% from 6:20 am, that is, the section with maximum demand is located within this period.

Regarding the days with the highest passenger demand, it is observed that: 75% of users belong to typical days (Monday to Friday), 25% correspond to atypical days (weekends). Therefore, we interpret that according to the demand of users, the activities are focused on commerce, employment, education carried out mostly between common or typical days and atypical days, recreation activities, commerce are linked and are presented in less quantity.

From a more general perspective, in the consolidation of the rise and fall of users, in the Guayaquil-San Gabriel direction (Monday to Friday), the section of maximum demand occurs at 4:45 p.m.; in similar distances of each section, which is why the load factor for these frequencies exceeds 100%, that is, it would exceed the passenger capacity that each unit can transport.

It can be summarized that the weekend maintains an occupancy rate of the transport service is stable, although in 3 frequencies the occupancy factor generally exceeds 100% of its capacity, it is observed that from 7:05 to 8:55 am, there is a similarity, with a rebound at 10:45, that is, at this time our maximum section is located with a design volume of 278. Within this research context, the increased curve manifests itself on Wednesday as the rate highest occupancy during the week, with 361 passengers. While the weekends on Saturday show high participation compared to Sunday.

Below are the results of the surveys applied

to the users of route 3, which runs from San Gabriel to Guayaquil and vice versa, entered into a database and processed in Excel.

Within the framework of the responses of the respondents, 96% indicated that the implementation of Route 3 benefits the population under study this way the inhabitants of this sector and surrounding areas will be the main beneficiaries by having a service of transport itself that will allow you to mobilize to carry out your different daily activities.

Based on the results obtained, 54% of respondents indicated that they use this route every day, with an occupancy rate exceeding 50 50 throughout its journey.

Within the same investigative context, 97% indicated that they agree with the rate, they consider that they are within what the laws stipulate. Only 3% expressed that they disagree.

Regarding the level of occupancy of the units with the capacity carried out, the occupancy factor proceeded to divide the number of users on board the units on the route of Route 3 direction San Gabriel - Guayaquil and Guayaquil - San Gabriel, on the capacity average vehicle in which all the units of the Señor de los Milagros transport cooperative are handled, with a capacity of 44 passengers. The following formula was applied:

$$a = \frac{P}{Cv}$$

Substituting the formula:

- a= Load factor
- P= Passenger on board or design volume
- Cv= Vehicle capacity

During the route of route 3, the occupancy rate of 49.13% is evident. In other words, in general, the demand of users is irregular, so much so that its occupancy rate equals 50%

Section		San Gabriel-Nobol		Nobol-Petrillo		Petrillo-Guayaquil		total go up	total down	Load factor (a)
No.	Frequency	S	B.	S	B.	S	B.			
1	5:05	21	6	25	11	18	47	64	64	56,68 %
2	5:35	20	8	35	17	19	49	74	74	79,55 %
3	6:20	107	45	66	27	29	130	202	202	243,18 %
4	7:05	64	27	60	18	38	117	162	162	145,45 %
5	8:45	38	11	64	18	16	89	118	118	145,45 %
6	9:45	39	11	35	12	40	91	114	114	90,91 %
7	10:45	43	15	61	26	39	102	143	143	138,64 %
8	11:45	48	26	45	12	36	91	129	129	109,09 %
9	12:45	40	17	49	12	38	98	127	127	111,36 %
10	13:45	63	31	36	18	18	68	117	117	143,18 %
11	14:45	37	17	45	23	25	67	107	107	102,27 %
12	16:00	49	22	61	29	29	88	139	139	138,64 %
Total passengers per section		569	236	582	223	3. 4. 5	1037	1496	1496	125.38% % Total

Table 1 - Consolidated promotion and relegation (San Gabriel-Guayaquil) Monday to Friday

Number of passengers by frequencies San Gabriel-Guayaquil (Sat and Sun)										
Section		San Gabriel-Nobol		Nobol-Petrillo		Petrillo-Guayaquil		Total go up	total down	load factor
Number	Frequency	S	B.	S	B.	S	B.			
1	5:05	4	2	3	0	5	10	12	12	11,36 %
2	5:35	8	2	6	3	7	16	21	21	18,18 %
3	6:20	9	2	2	1	9	17	20	20	20,45 %
4	7:05	27	16	10	8	5	18	42	42	61,36 %
5	8:45	23	12	7	8	7	17	37	37	52,27 %
6	9:30	36	11	13	2	12	48	61	61	81,82 %
7	10:15	24	10	6	13	4	11	34	34	54,55 %
8	11:00	25	10	5	8	5	17	35	35	56,82 %
9	12:30	26	13	8	6	7	22	41	41	59,09 %
10	13:30	33	16	17	12	10	32	60	60	75,00 %
11	14:30	17	9	7	7	4	12	28	28	38,64 %
12	15:30	29	12	15	10	8	30	52	52	65,91 %
13	16:00	26	7	12	8	9	32	47	47	59,09 %
Total passengers per section		287	122	111	86	92	282	490	490	% Total 50.35%

Board1 - Consolidated promotion and drop off passengers

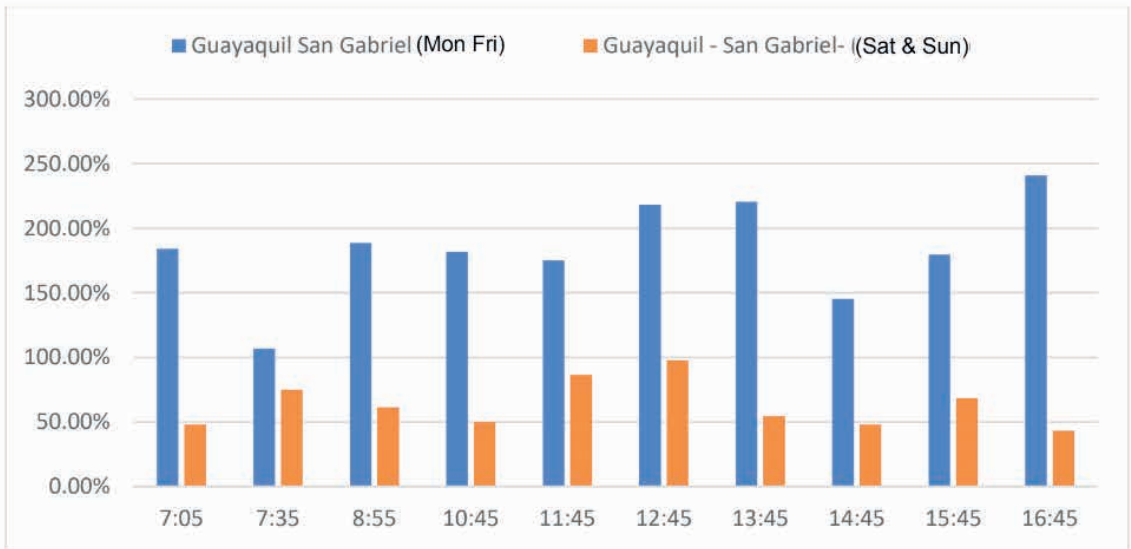


Figure 2. Consolidated promotions and relegations ((Monday – Friday / Saturday and Sunday)

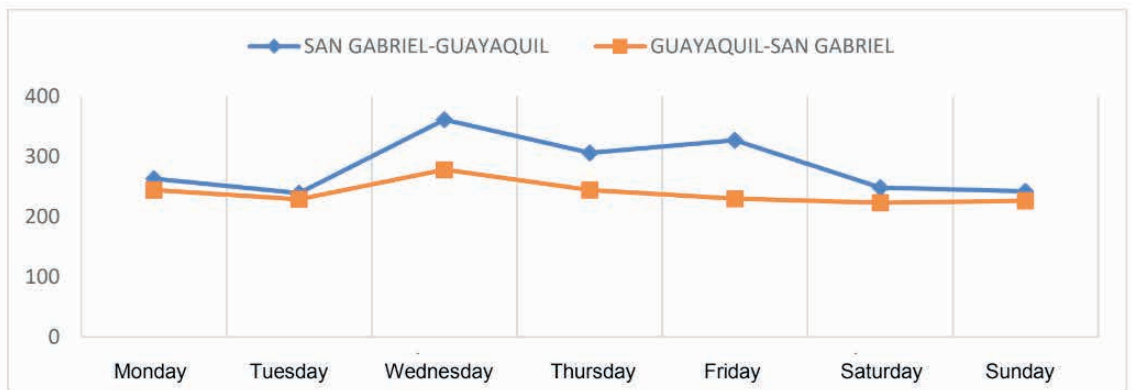


Figure 3. Consolidated passenger pick-ups and drop-offs Gye-San Gabriel return

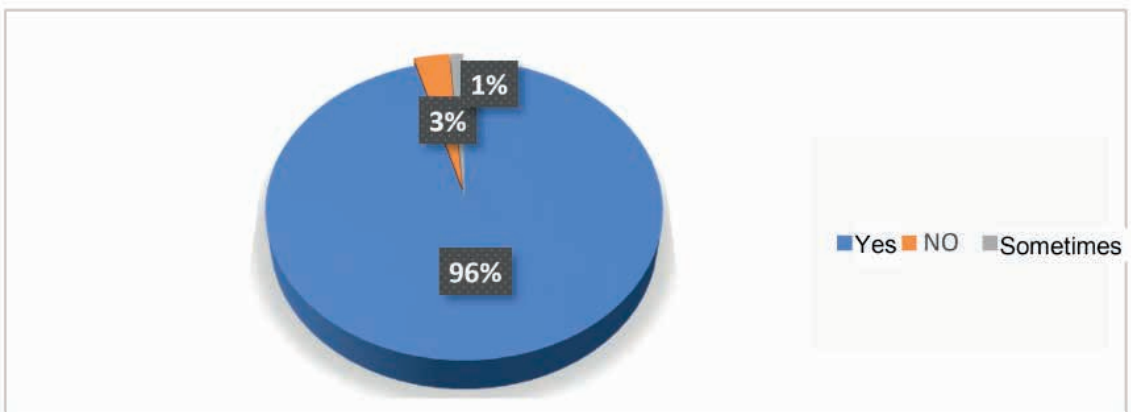


Figure 4. Benefits the new route San Gabriel – Gye and vice versa

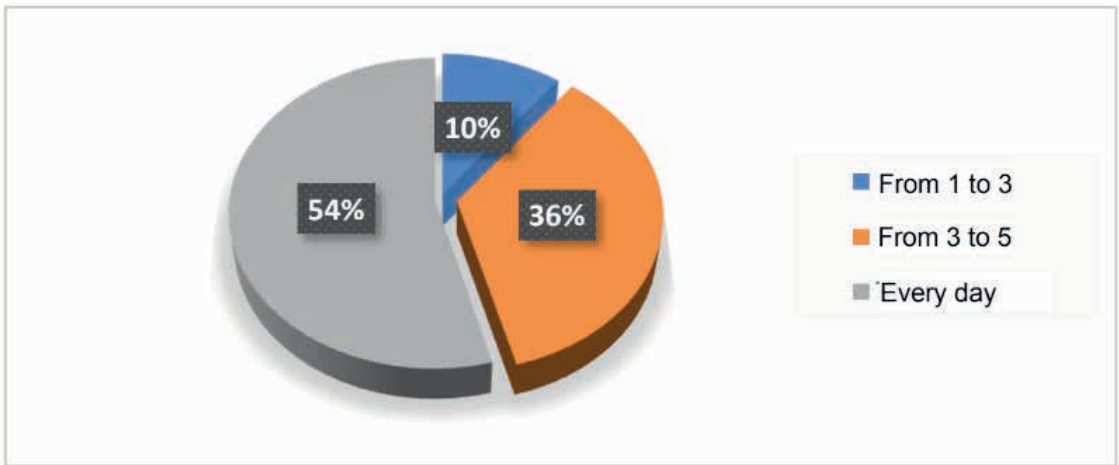


Figure 5. Times you use the service on this route

Route	Days	Occupancy rate / Higher volume	Occupancy rate /Lower volume
Going	Wednesday	69.7	
Going	Tuesday		6.06
Going	Saturday		2.27
Going	Sunday	42.58	
Return	Wednesday	47.73	
Return	Tuesday		8.33
Return	Saturday		20.45
Return	Sunday	36.52	
Total		64.1325	9.2775

Board2 - Consolidated occupancy rate higher / lower volume

Route 3	Worth
Guayaquil-San Gabriel	\$1.50
Petrillo-San Gabriel	\$1.00
Nobol-San Gabriel	\$0.75
minimum stop	\$0.50

Note:Units dispatched from San Gabriel must pay \$3.00 at the Bus Terminal.

Board3 - Route 3 San Gabriel-Guayaquil and vice versa

Saint Gabriel	Detour	Bus station	Dispatched Terminal
5:05:00	5:25:00	6:15:00	6:30 a.m.
5:35:00	5:55:00	6:45:00	7:00 a.m.
6:05:00	6:25:00	7:15 a.m.	7:30 a.m.
6:35:00	6:55:00	7:45:00	8:00 a.m.
7:05:00	7:25:00	8:15 a.m.	9:00 a.m.

Board4 - Office hours of the "Señor de los Milagros" units

of its vehicle capacity, therefore, the capacity of its offered line is still maintained in optimal conditions to accommodate a greater number of users, it is assumed because it was considered atypical days.

DISCUSSION

RESULTS OF THE SAN GABRIEL – GUAYAQUIL ROUTE STUDY, ON USER DEMAND

The highway transport service system contributes to the economic development of the different populations, since it constitutes the means of mobilizing people and products that become consumer goods, industrialized products, exports, among other services; From this context, the importance of transport operators in society is born. The socioeconomic benefits derive from savings in travel costs, passenger transfers, vehicle operating costs and driver travel times.

The study found that adjacent populations such as Bermejo, Piñal, and San Jacinto are indirect beneficiaries since they connect to the San Gabriel highway and are linked to the state road network that joins the Nobol and Guayaquil cantons. It is important to point out that the road from San Gabriel to the Las Cañas detour has little vertical signage, in compliance with the established regulations for vertical and horizontal road signage INEN 004, part 1 and 2. The route has been segmented by 3 sections that include San Gabriel - Las Cañas detour, belonging to the Daule canton, as the first section whose current state of the road is gravel type, with two lanes (round trip), the average speed of 40 km /h. The second and third sections Las Cañas - Nobol and Nobol-Petrillo detour comprise the study area, whose main roads have their roadway 100% in an adequate state, which is acceptable for the study in relation to the necessary road infrastructure.

Among the operating characteristics, the

units have an average capacity of 44 seated passengers, where all the units rotate their route weekly. In relation to the rate, users must cancel for each of the sections and based on the information collected, 97% of users currently agree with the current ticket rate.

The units that are dispatched to the San Gabriel Campus correspond to:

Regarding the estimated time between each section (San Gabriel - Nobol) and section (Nobol - Petrillo) an average of 20 minutes, while the section (Petrillo - Guayaquil) approximately 30 minutes; complying with a travel time of approximately 1h10 minutes.

ALTERNATIVES FOR THE INHABITANTS OF THE SAN GABRIEL ENCLOSURE TO BECOME PERMANENT USERS

To attract the inhabitants of the San Gabriel sector and its nearby towns, it includes three important points: Create an affective bond with the operator “Live good experiences”, during your trip, that is, in the comfort of the seats, security cameras, seat belts of security. The link is one of the sensations in each trip, since it contains the promise of developing unique emotions, differentiating it from the competition by offering an optimal service, with warmth in the attention, service free wifi, air conditioning. Another important factor is credibility, respecting the fixed and differentiated rate, travel time with no tendency to increase, similarly it must include permanent control of compliance with schedules, frequencies and routes that can be controlled through the GPS system.

Finally, the effort made to rehabilitate and maintain the public transport service is transcendental in the life and economy of the inhabitants of the sectors that belong to the different sections of the study. From the same perspective, the option to extend the route that covers Route 3 towards the Piñal, San

Jacinto and Bermejo sectors must be offered.

CONCLUSIONS

- When evaluating the compliance of land transport services on route 3 (San Gabriel-Guayaquil and vice versa) of the transport units of the Señor de los Milagros cooperative, it was detected that their routes do not comply with what is established in the Resolution of the Board of Directors (Annex 3), which stipulates the hours of operation of the service from 05:05 to 07:05 with an interval of 30 minutes. According to the data collected in the weekly and weekend capacity, the buses start their work at 7:05 a.m. until 3:30 p.m. In the same context of results, in the personal surveys carried out it was observed that 42% must wait between 10 to 15 minutes, 45% between 30 to 45 minutes;
- The demand of users through the field study carried out through the gauging of ascents and descents of passengers was positive considering for section 3 since they served to determine the occupancy factor being the maximum demand 44.13% and the factor of Average occupancy with lower demand is 9.27% in the transport units studied. From a broader perspective, it was possible to describe the characteristics and occupancy level of the units, where it was established that the occupancy factor was favorable in several sections during its routes, even exceeding 100% of the capacity of each unit. On weekends, both days were taken to consider the contrast of vehicle occupancy factors, whose results were positive for the opening of Route 3 from San Gabriel - Guayaquil and vice versa,
- In the proposal of alternatives so

that the inhabitants of the San Gabriel enclosure and its surroundings become permanent users of the Señor de los Milagros cooperative, it seeks to appeal to the emotions of the users, which are presented as essential aspects when choosing a mode transportation, that is, providing them with quality services, compliance with frequencies, schedules, fares, travel times, routes, and others; so that higher demand values increase in the current service, compared to the competition that offers alternative services of lower quality.

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