

A STUDY ON INTERISLAND PASSENGER TRANSPORT MODE SWITCHING IN THE PHILIPPINES

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Abstract: This study looks into the phenomena of recently introduced high speed inter-island maritime transport. Based on a survey of 687 HSC passengers, a comparison of the conditions of the prior mode and HSCs is made. Focus is placed on the trade-off between accepted fare differential and reduction in travel time. The analyses reveal that there are observable limits to the trade-off between marginal increase in fare and marginal decrease in travel time. This result is further validated by mode choice criteria rankings provided by the passengers.

Key Words: High-speed craft, inter-island transport, mode-switching

1. INTRODUCTION

Inter-island transportation in the Philippines has been relatively neglected among the transport sectors in terms of the quality of service being offered to passengers. This is despite the Philippines being an archipelago and water comprising a large portion of its domain. From this relatively low level of development, it is expected that any improvements in the area of maritime transport could have implications to the economic as well as social integration of the Philippines. Analysis such as these are important because of the insight they may provide on the impact these new service provision to possible shifts in infrastructure supply which may give significant benefits to various industries¹. For example, some businesses may forgo establishing a new office in another city if the new service makes it possible to commute between the home city and the city where they would like to establish business with.

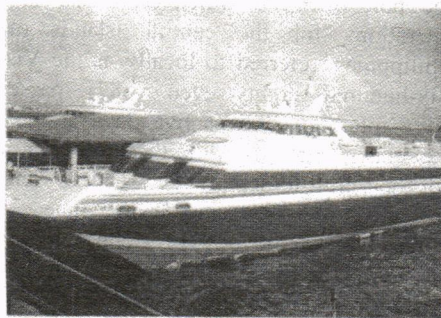


Figure 1.1 Example of a High Speed Craft

¹ Bråthen and Hervik (1997) analyzed strait crossings and noted that these are of special interest because these strait crossings may imply a shift in the infrastructure supply which may give substantial benefit to industry.

Starting in the early 1990's, several private companies introduced relatively innovative (based on the local context) types of service. Variants of these are catamarans with capacities of up to 400 passengers. These provide faster and more comfortable service, having air conditioning and airline-type seats, although at a higher fare level. Prior to the introduction of High Speed Craft (HSCs), great differentiation between various inter-island services did not exist in terms of speed.² For most part, maritime passenger transport tended to be (and still remains) relatively unsafe, slow and lacking in amenities. The main reason for continued patronage is that in many cases, they are the only means of getting to and from some destinations. For other inter-island origin-destination pairs, it is because sea travel (in contrast to air travel) offers (observably) cheaper alternatives. The only points of comparison were frequency, comfort, and directness of connection between ports.

This study is an attempt to quantify the mode-switching behavior based on the assumption that people are weighing the benefits versus cost in the use of the different modes (HCS vs ROROs or ferries). The objective is to describe the mode evaluation activity by present HSC users that resulted in their switching to HSCs.

2. DATA COLLECTION

In order to collect information on mode-switching, passengers currently using HSCs were interviewed and asked to describe their reasons for shifting as well as to describe their perceptions regarding the HSC and the previous mode that they used. For this purpose, passenger interview surveys were conducted at the port of Cebu which is a hub of HCS operations for the central islands of the Philippines, referred to locally as the Visayas. Six-hundred eighty-seven (687) passengers were interviewed over five days at the HSC passenger terminals while they were waiting to for their craft to depart. The surveys were able to cover passengers from nine routes connecting to the port of Cebu. Figure 2.1 shows the areas covered by the routes whose passengers were covered by the surveys.

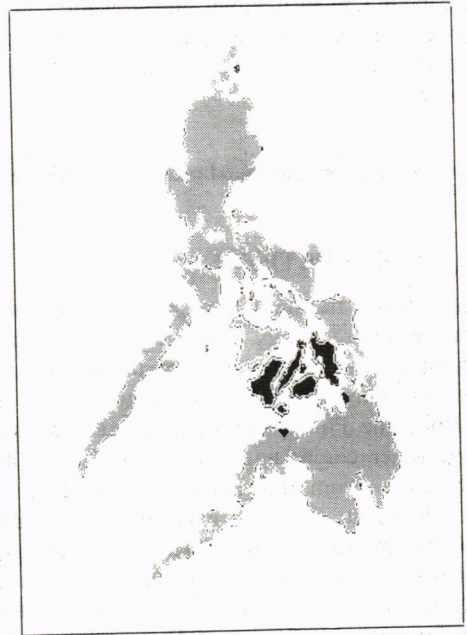


Figure 2.1 Service area for HSC routes covered by the survey

3. ANALYSIS OF TRIP MAKER CHARACTERISTICS

This section presents the results of analysis covering various aspects of the trip-making activity, such as trip purpose, route characteristics, travel time and travel cost.

² However, it should be noted that for the larger vessels, there are many different levels of comfort that can be enjoyed at corresponding prices. The lowest classes use several decks wherein passengers are provided a rudimentary bunk for sleeping and ventilation comes directly from the outside; oftentimes, this class is only protected from the elements by the deck above it and canvas at the sides

3.1 Socio-Economic Characteristics of Respondents

The monthly incomes that the respondents declared in the survey showed average values slightly lower than those indicated in a survey conducted by one of the HSC companies in 1999 (Philippine Fast Ferries Corporation). Figure 3.1 shows a comparison of the frequency distributions for common income intervals.

The average monthly income calculated from the current survey is about 14,000 pesos, whereas it is roughly 16,500 pesos from the 1999 passenger survey³. The result is reasonable due to the fact that the current survey which includes other companies that charge lower fares (up to 50% lower)⁴ and thus are expected to attract people of relatively lower incomes than those patronizing the services of the PFFC.

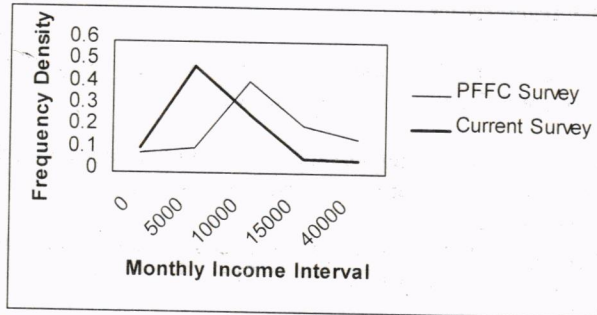


Figure 3.1 Comparison of the distribution of monthly incomes of survey respondents

3.2 Trip Purpose

The most frequently declared reason for the respondents making the trip via HSC was that

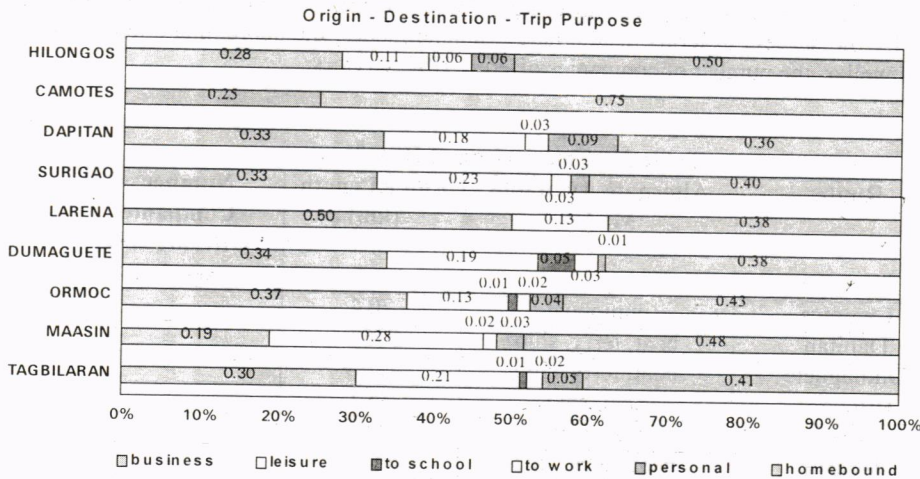


Figure 3.2 Declared trip purposes of respondents

³ These values are approximately double the average monthly family income in Central Visayas in 1997, which is a little over 7,000 pesos. (National Statistics Office)

they were "homebound." A very close second was for the purpose of "business," which includes transactions that are work related or commerce related, as opposed to those dealing with "private" or personal matters. This seems reasonable since Cebu is a major commercial center for central Philippines.

Accordingly, homebound trips reflect the recent phenomenon of increased number of round-trips being made by visitors to Cebu within the span of a day (or even less). Whereas visitors in the past usually had to stay overnight in Cebu due to the lack of speed and frequency of trips to their points of origin, this changed with the introduction of HSCs.

3.3 Route Characteristics

The nine routes covered by the survey have varying availability of alternative transport modes. These are defined and classified as follows

- a) **Ship:** a large sea-going vessel usually having a capacity of 500 passengers or more also used for long-haul journeys. These may also carry vehicles and goods, but is most visibly for passengers.
- b) **Ferry:** used to ferry passengers, vehicles or goods (with a greater proportion of these than for ships), it is usually of the RORO type, with a carrying capacity of about 200 to 300 people.
- c) **Boat:** smaller vessel with a capacity of 100 to 200 people; other cargo are usually the personal effects of the passengers
- d) **Pumpboat:** Usually of the outrigger type, these carry from 10 to 30 people.

The first two are conventional types and are imported (usually second-hand), with high carrying capacities. The second two types are usually constructed locally, but having non-standard design, and low carrying capacities. Table 3.1 shows a comparison of the routes covered by the survey, in terms of alternate available modes, the approximate length of the routes as well as the number of companies offering HSC services.

Table 3.1 Comparison of HSC Routes

Route	Alternate Available Modes	Route Length (km)	Number of Companies Offering HSC services
Camotes	pumpboat	70.4	1
Dapitan	boat, ferry, ship	225.0	2
Dumaguete	boat, ferry, ship	150.9	2
Hilongos	boat, ship	83.3	1
Larena	boat, ferry	184.3	2
Maasin	boat, ferry, ship	111.1	1
Ormoc	boat, ferry, ship	114.8	2
Surigao	boat, ferry, ship	194.5	1
Tagbilaran	boat, ferry, ship	79.6	3

⁴ An interview with PFCC revealed that the disparity in fare rates is due to the fact that higher operating costs (due largely to the use of imported vessels) are experienced by the company, thus requiring higher fares – although observably, the company with the higher fare also offered relatively better service conditions.

The providers of ferry and ship services are usually large companies while the boats and pumpboats are usually operated by individuals or smaller companies. Apart from the nature of competing modes along the respective routes, these also differ in the level of directness in connection to the port of Cebu. Figure 3.3 shows the route structure and the intermediate connections made in coming from Cebu.

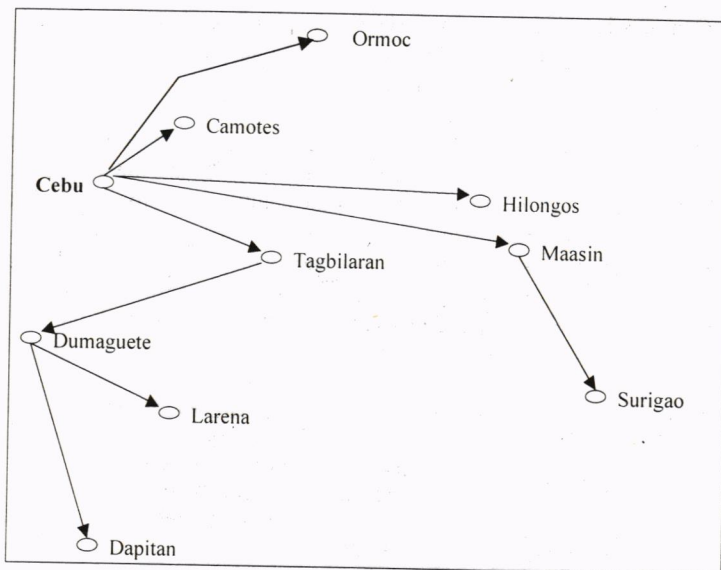


Figure 3.3 Interconnection Structure of HSC Routes

From Figure 3.3 it can be seen that five (5) of the routes are direct, while two (2) have one stopover, and two (2) have two stopovers. Table 3.2 summarizes comparative fares in terms of the basic fare and the estimated fare per kilometer of travel.

Table 3.2 Comparison of HSC Services by Route

Route / Destination	Number of Trips Departing from Cebu Daily	Number of Stopovers	Fare (Pesos)	Route Length (km)	Estimated Fare per Kilometer Traveled by HSC ⁵ (Pesos/km)
Camotes	2	0	200	70.4	2.84
Dapitan	1	2	750	225.0	3.33
Dumaguete	6	1	430	150.9	2.85
Hilongos	1	0	320	83.3	3.84
Larena	2	2	580	184.3	3.15
Maasin	2	0	400	111.1	3.60
Ormoc	5	0	410	114.8	3.57
Surigao	1	1	710	194.5	3.65
Tagbilaran	13	0	320	79.6	4.02

Tagbilaran has the most expensive fare in terms of the gross estimated fare per kilometer of travel. Although this does not directly take into account the cost of the stopovers, it is

⁵ Computed as individual Fare divided by the Route Length.

indicative of the relative expensiveness (from the passengers' viewpoint) of the Cebu-Tagbilaran route. At the same time, this route has the highest frequency of trips. These two conditions reflect the strong economic relationship of Tagbilaran with Cebu. In other words, there is a strong motivation for passengers to make trips between these two cities, in spite of relatively higher cost.

On the other hand, Camotes is a relatively poor island that is politically a part of the Province of Cebu. The company servicing this route offers generally cheaper rates, although of lesser frequency with accommodations having lower quality.

Table 3.3 shows a comparison monthly income averaged among the respondents who were willing to divulge their information. It can be seen that Camotes has the lowest recorded average. Although this data may be treated with some caution due to small number of respondents, it tallies with "common knowledge" regarding their economic situation. On the other hand, incomes of respondents heading for Surigao averaged the highest. With the exception of Larena, destinations wherein the combined share of respondents with a trip purpose of either business or work, respondents tended to have incomes above the survey population average.

Table 3.3 Comparison of Respondents' Monthly Income by Route

Destination	Average Income	Number of Respondents Who Gave Income Data
Camotes	6,568	3
Dapitan	15,881	18
Dumaguete	14,127	53
Hilongos	8,747	11
Larena	11,934	6
Maasin	16,089	27
Ormoc	15,547	117
Surigao	19,198	21
Tagbilaran	16,047	141
Survey Population	15,469	397

4. MODE CHOICE

4.1 Previous Mode

Respondents were asked to identify the modes that they used prior to switching to HSCs. Figure 4.1 mentions two additional modes – plane and land trip⁶. It is notable that 93% are purely water based. Boats, ships and ferries predominate with 44%, 22%, and 26% respectively.

⁶ A "land-trip" actually consists of a bus ride with the bus getting unto a RORO vessel to get across bodies of water. After the crossing is completed, the journey continues on land.

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Although all routes are less than 250 kilometers in length, several destinations did have plane services. However, after the introduction of HSCs, the few air routes that did exist were closed due to the limited operating revenues, a situation which was further exacerbated by competition coming from the HSCs.

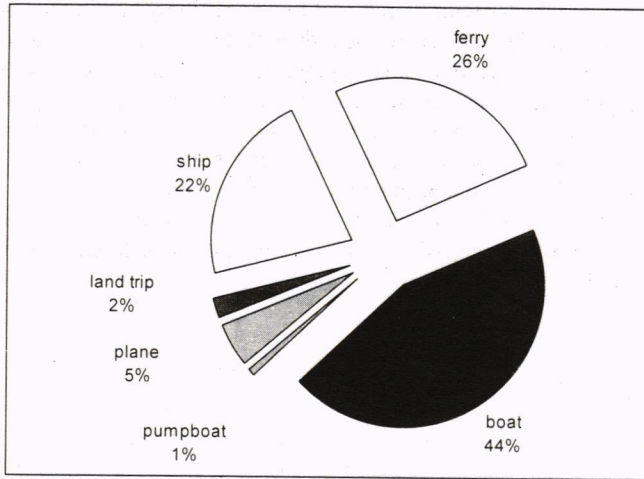


Figure 4.1 Share of Respondents' Previous Modes

4.2 Comparison of Fares, Before and After

Figure 4.2 shows the variance of fares for all other modes versus for the HSC. It is clear that for these modes vary greatly in terms of the fare that they required – thus creating a large variance in the difference in fare cost between the HSC (present mode) and prior mode (from which they switched). The same figure shows the trendline for the fares of HSC with respect to distance. Because this trendline is well above the majority of prior fares being paid by the passengers, it is clear that the HSC fare is significantly higher than that of the prior modes. On the other hand, the variance in existing fares can be seen as an indication of irregularities regarding compliance with existing safety inspection procedures (Ynion 1999). These cutting of corners may have allowed some operators to lower their fare rates, resulting in the difference in the fares actually charged along a given route.

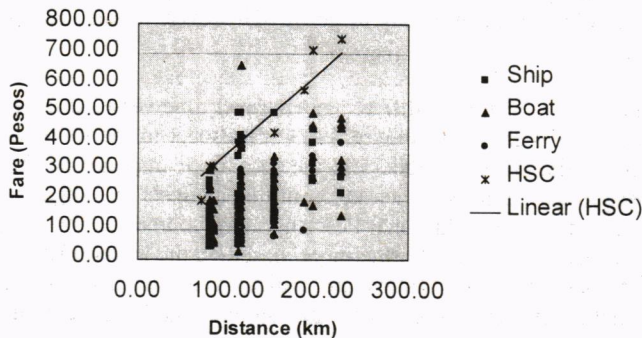


Figure 4.2 Comparison of Fares of HSC with Fares of Prior Modes

4.3 Relationship of Travel Time Reduction to Acceptable Travel Cost Increase

From the data acquired through the survey, a plot of the difference in travel cost versus the difference in travel time can be made. From this plot (shown in Figure 4.3), it is possible to observe a region of *inclusion* which might be referred to as a region wherein the combination of travel cost increase is acceptable vis-à-vis to the reduction to the travel time, thus resulting in a shifting of travel mode. Beyond this region, the cost increases are seemingly unacceptable to the respondents, since none of them are recorded as *accepting* such a condition. Thus, it is evident that there is a trade-off being made by passengers. However, since different individuals can be expected to have different thresholds with respect to what cost increase is fair, given an improvement in service (i.e. reduction of travel time), a spread of data points is expectable. On the other hand, it is not possible to observe the personal thresholds of individual respondents since they may or may not have found the prices to be near to their acceptable limit.

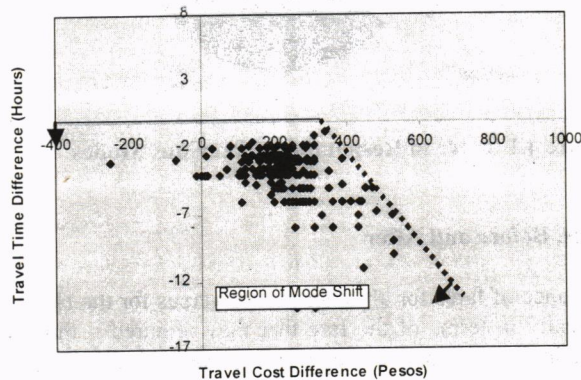


Figure 4.3 Relationship between travel cost difference and travel time difference

Passengers theoretically would pay an additional amount in fare as long as there is a corresponding increase in the quality of service. Viewing the travel time decrease brought about by the higher travel speed of the HSCs is ostensibly being traded against the relative increase in fare that they would have to pay to get it. However, this is clearest only at the periphery of the observations.

On the other hand, the trade-off between differences in travel time versus differences in travel cost indicated by their ratio is shown in Figure 4.4, with respect to the travel distance. The figure shows the trend of the *accepted* trade-offs which may or may not be the individual's limit. The lowermost plotted values are then taken in this analysis to indicate the minimum required decrease in time for every additional Peso that may be invested by the passenger to improve (reduce) his or her travel time. Furthermore, based on the lowermost recorded ratios, we can propose that these minimum ratios are indicated to increase as travel distance increases – meaning that passengers become more demanding regarding the tradeoff, that they must get a greater reduction for their additional fare money.

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The values above the broken line are thus all acceptable to all passengers. Since it is reasonable to expect that all passengers will be able to accept better trade-offs than the one that they actually accepted, it is reasonable that a minimum level of trade-off exist. Whether this level is actually a line increasing with distance remains to be further validated. Also the effect of the number of stopovers on the tradeoff has not yet been considered.

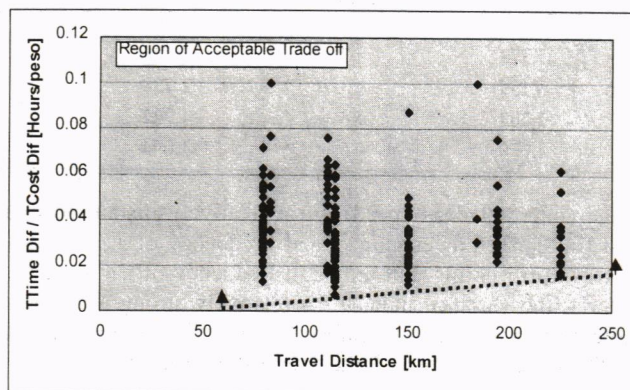


Figure 4.4 Relationship of the Ratio of Travel Time Reduction to Additional Travel Fare with Travel Distance

It can be seen that there is a lot of variation between individual ratios even for the same travel distance (and hence the same origin/destination). This can partly be explained that a number of the respondents made the shift several years and were only asked to provide their recollection. It is plausible that they may not have remembered their previous travel cost or travel time very well, leading to the discrepancies between the individual responses. Also, even among similar prior modes, there is some variation among the available service providers in terms of cost and travel time. Nevertheless, the analysis of their trade-off gives the indicative result supporting the conclusion that sensitivity to the trade-off becomes less as travel distance increases.

In summary, the analyses of the relationship between travel cost increase and travel time reduction appears to support the notion of trip makers finding the existing trade-off acceptable. By examining extreme values of travel time reduction and travel cost increase, it becomes evident that there is a trade-off frontier. This frontier indicates that beyond a certain basic increase in fare (which may possibly be a region for indifference to fare increase), the trade-off becomes a matter essential to the decision making (whether or not to use the mode with the higher level of service).

4.4 Reasons for Choosing a Mode

The respondents were asked to rank various criteria that they use in choosing a mode. A rating of 5 was awarded to their first choice, 4 for their second choice and so on. As can be seen in Table 4.2, Safety is very important to the respondents; this is further reinforced by the lowest variance for any of the criteria, indicating strong agreement among respondents about

Safety being the most important consideration. It was inferred that the respondents chose to use the HSCs based on these criteria.

Table 4.2 Ranking mode choice criteria

Criteria	Average Rating	Rank According To Average Rating	Variance of Rating	Rank According to Variance
Safety	4.194	1	1.026	1
Comfort	3.373	2	1.148	3
Travel Time (speed)	3.159	3	1.738	4
Travel Cost (economy)	2.207	4	1.922	5
Frequency of Trips	2.070	5	1.094	2

Comfort and Travel Time (interpreted as speed) are a relatively distant second and third respectively. Travel cost (interpreted as economy) and Frequency of Trips follow as fourth and fifth respectively. It is worth noting that although frequency of trips is taken to be the fifth most important criteria, the variance indicates a relatively strong agreement regarding this. Thus the most stable criteria appear to be safety (as first criteria) and frequency of trips (as fifth criteria). Comfort is a relatively close third, in terms of variance.

These results primarily indicate the importance of safety and comfort, meaning the perception is that safety issues need to be addressed along with consumer issues such as quality of service provided. At present, the Philippines has much work to do towards raising the quality of maritime services.

With respect direct economic considerations of passengers the results of the analysis in the indicate that the consideration of travel time savings precedes the determination of travel cost that these passengers are willing to accept, and this forms the basis of their decision about shifting to a certain mode or not. This means that passengers are willing to pay to have improvements in the quality of service, especially those who are currently using HSCs.

While it is difficult to generalize beyond HSC users, it is conceivable that users of other modes may feel similarly about the safety and comfort issues, except that they may be constrained in their ability to pay for these. Thus the government, taking a paternalistic stance, would need to seek means of encouraging the improvement of safety and comfort in maritime transport.

5. CONCLUSIONS AND RECOMMENDATIONS

The preceding analyses indicate the following:

- 1) Most passengers that have shifted to HSCs came from prior conventional forms of marine inter-island transport (ships, ferries and boats as per given definitions).
- 2) Fares for HSCs are significantly higher than the modes previous used by HSC passengers.
- 3) After a basic increase in fare that the passengers are apparently indifferent to, there is an observable upper limit to ratio of the fare increase that is acceptable with respect to the achieved decrease in travel time (an improvement in the quality of service).
- 4) Safety is the primary reason why passengers chose to use HSCs.
- 5) For the surveyed HSC passengers, consideration of travel time savings precedes consideration of travel cost in the decision making process. In other words, for

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passengers, the travel-time savings they get will determine the cost increase they will accept.

To improve the level of study on the choice of HSC as a travel mode, the following recommendations are made:

- 1) Better consideration should be made of the impact of the number of stopovers on the trade-off process
- 2) A comparison with the characteristics of those passengers who *did not shift* to HSC should be made to ascertain the extent of other possible determinants in the mode switching process.

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