

# **A Feasibility Study of Ferry Transport Service from a Transport-Planning Perspective: Case of Public Ferry between Colombo and Mannar**

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## **1. Introduction**

This study includes an analysis of the conditions of existing public transport services; future transportation needs, and public-transportation alternatives as a means of enhancing intercity transport in Sri Lanka. Daily passengers, known as commuters, comprise regular passengers and non-regular passengers. Irrespective of mode of transport, it is not apparent whether all passengers are satisfied with their trips in terms of service quality, travel time, reliability of the service, comfort level and safety. Introduction of an alternative transport service which has lower generalized costs would undeniably be a better solution to attract more commuters.

Turcotte (2006) finds that there are more people who like commuting than those who are reluctant to commute. The younger generation dislikes commuting for longer durations, whereas more people like to commute on public transit than driving their own car, because it provides them an opportunity to think about personal matters, read a book, listen to music, or talk over the phone. The study, which is based on the influence of stress level, shows that passenger perceptions of daily travel are mostly based on the duration of travel time.

According to Breidert, Hashler and Reutterer (2006), willingness to pay can be measured in different ways. Surveying is not the sole method that can be used. Louviere et al (2000), has found out that willingness to pay measurements can be categorised in to two main parts: ‘revealed preference’ which is based on price response data and ‘stated preference’ based on data obtained from surveys.

This research mainly focuses on passenger demand for the current inter-provincial bus services and the introduction of an alternative ferry service for commuter. Passenger ferry service is among the main solutions implemented in different countries for public transportation. Compared to bus transportation, ferry services have higher flexibility, less infrastructure costs, high passenger-carrying capacity and also can serve large geographical areas although with less transfers.

## **2. Objectives**

The main objective of this research is to identify passenger satisfaction level regarding the existing public transport services, especially transportation by bus. The bus service between Colombo Fort and Mannar is considered as the case for data collection. Subsequently, based on generalized cost parameters inferred on a hypothetical ferry transit service which is yet to be implemented passengers' willingness to shift from bus transportation and additionally to pay for such service is considered.

## **3. Methodology**

The factors which affect commuters' satisfaction in public transport were identified as waiting time, monetary cost, service quality, cleanliness, comfort, reliability, operators' behaviour and attitude, safety, security and vehicle quality. The availability of clear information on the service such as an operating schedule is also decisive of service quality.

Primary data was derived from three types of services provided by Ceylon Transport Board (CTB) and regulated by the National Transport Commission (NTC). Bus commuters were interviewed using a structured questionnaire. The survey included people who are travelling between the selected O-D pair. Based on information gathered from previous studies, a questionnaire was developed. The questionnaire includes (a) Timeliness, (b) Safety and security, (c) Comfort, (d) Accessibility, (d) Cleanliness, (e) Customer service and (f) Convenience. This questionnaire measured the attitudes and awareness of passengers about their trip. The responses to questions were based on the Likert scale from 0 to 5, 0 standing for the lowest satisfaction and 5 for the highest satisfaction ranking. To get a basic interpretation of the data, descriptive statistics were obtained. The reliability analysis was performed to check the data consistency and stability. Cronbach's alpha, the coefficient for reliability was analysed. Descriptive statistics such as frequencies, descriptive, cross tables and chi-square tests were used for data analysis. The survey was conducted in both O-D nodes. A total number of 242 passenger responses from both Colombo and Mannar bus stations were received. The data were analysed using excel and SPSS software. Data were analysed from various aspects to derive evidence to determine whether a ferry service is more feasible than the current bus service. Included in this study is a passenger demand analysis for a ferry service which documents past visitation and projected future passenger forecasts.

## **4. Results and Discussion**

According to the results obtained, passenger willingness to pay is not based solely on saving travel time but also on other factors such as comfort, safety, cost, frequency

of service and accessibility. Total demand was ascertained through each bus conductor working between the selected O-D pair. Total passenger demand is approximately 1,890 passengers travelling between the selected O-D pair per week. As per the research finding on travel time analysis as perceived by passengers, the public bus service takes an average of 9 hours to travel between the selected O-D pair. Further the internal conditions of the buses made passengers' travel experience uncomfortable. The summary of statistics of factors important for selecting a transport mode by passengers is shown in Table 1.

**Table 1: Important factors for choosing the mode of transport**

	Mean
Travel Time	4.07
Cost(Fare)	3.49
Convenience/Flexibility	3.34
Comfort	3.49
Safety	3.62

Likert Scale: 0 - Lowest Satisfaction      5 - Highest Satisfaction

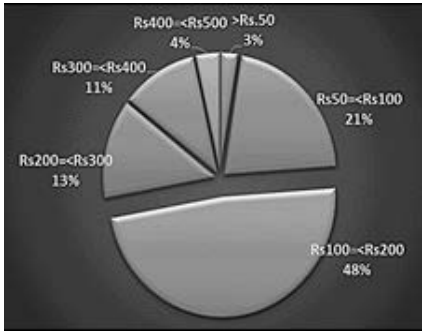
Chi-square test carried on passengers' preferences shows that the preferences on bus service in terms of willingness to pay has a significant relationship with the trip factors (the p value is less than 0.05). These factors include travel time of the current bus service, space available on buses, temperature in buses and safety. According to the Chi-square test,  $p = 0.036 < 0.05$ , which means that there is a significant relationship between two variables. Current bus passengers are giving more priority to travel time for transit service. In order to shift the ferry transit, their willingness to pay is shown in Table 2.

**Table 2: Chi-Square Tests - WTP and Travel Time**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	88.077	66	.036
Likelihood Ratio	92.333	66	.018
Linear-by-Linear Association	.000	1	.992
N of Valid Cases	201		

Considering passengers' willingness to pay, given that the existing bus fare is approximately LKR429.00, most passengers are willing to pay extra for a new ferry transport, such increase being between LKR100.00 and LKR200.00 (Figure 1).

Passenger ferry, Mary DODyssey



**Figure 4: Willingness to pay for ferry** **Figure 2: The Proposed Vessel: Highspeed service**

#### 4.1. Vessel Selected for analysis

The ferry shown in Figure 2 offers an attractive alternative to buses along inland waterways. The vessel speed is 30+ knots, and it is a low wake, aluminium catamaran ferry. It has a capacity of 150 -200, which may optimize the expected demand of passengers in the selected O-D pair.

#### 4.2 Analysis of current bus services and new ferry service

Table 3 compares the current bus service and the new ferry service using the sample data.

**Table 3: Operational features of the current bus service and the preferred ferry service**

One direction	Existing Normal Bus Service (Based on survey data)	Proposed Public Ferry Transit Service <sup>a</sup>
Travel Time	9 hours	4 hours 30 minutes
Fare per passenger	Rs.500 - Rs.600	Rs.700 - Rs.800
Trip per Day	13	2
Capacity per mode	60 Seats	150 – 200 Seats

<sup>(a)</sup>Source-<http://www.nauticexpo.com/cat/ships/passengers-ships-ferries-fast-ferries-AG 1324.html>

The data shows that passengers can save 50% of their current travel time, if the new ferry service is implemented. Further incremental fare between the two modes is matched with the existing passengers' willingness to pay additionally to use the ferry service.

### 5. Conclusions and Recommendations

Saving travel time and being able to travel with convenience are important factors considered by commuters. In Sri Lanka, for long journeys, average travel times are

high due to road conditions. The study showed that on average it takes about 9 hours to travel a distance of 300 Km. Further, at present, passengers are more concerned about travel time. Bus passenger survey shows that 83% of passengers are willing to shift to another time saving transportation mode irrespective of trip purpose. Further not only saving travel time, but also comfort, fare, accessibility and safety are the other main factors that passenger expect from the new service.

The passengers would save 4 hours 30 minutes from their current travel time which they would have used for another alternative use. Passengers are not willing to pay a high price for the only quick transport service, but their preferences are based on comfort, fare, accessibility and safety of the mode as well. Further, passengers paid much attention to seating space and a favourable environment for travel.

## 6. References

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