

A STUDY ON PASSENGER ATTITUDES TOWARDS FUTURE INLAND FERRY SERVICE FROM NEGOMBO TO COLOMBO

DAR Chathuranga¹, RMNT Sirisoma²

Department of Management & Finance, General Sir John Kotelawala Defence University

¹Chathuranga2904@gmail.com, ²ntsirisoma@gmail.com

Abstract— Ferry services are used as a public transport mode in most of the countries for both passenger and cargo transportation and it is considered as more environmental friendly mode than other modes because of the low emission and the successful solution for the congested roads. In Sri Lankan context ferry transportation is not popular as day to day transport method. But in the ancient times there was a canal system which was created during in Dutch era and British era. This study is focussing on the Hamilton canal and Dutch canal which was a part of that ancient canal system, at present which are parallel to Negombo – Colombo highway. Although these two destinations connect by highway, railway and expressway, in the peak hours there is severe congestion occurred on the highway. Therefore, ferry service will be a good solution to minimize these issues. And both of these canals are blessed with natural beauty which attracts tourists. However inland ferry service is not familiar as a public transportation service among the passengers. Therefore, it is important get to know their attitudes towards ferry service. Attitudes of the potential passengers will be help to design the service according to passenger expectations and it will help to launch a successful ferry service between Negombo and Colombo. Most of the passengers are concern about the reliability, safety, responsiveness and comfort. But accessibility and affordability also important in long run process. Through the study, another factor which found out is, the service will be more trustworthy if it could be provided by a government body like Sri Lanka Navy. After conducting an attitude survey among daily transport users, the findings of this research are: passengers concern about the safety precautions of the boat and the station, comfort related facilities and also considering about a reliable service will be helpful for implementing successful ferry service between Negombo and Colombo.

Keywords— Inland ferry service, passenger attitudes, public transportation

Transporting passengers and goods using boats or ships are called as ferry transportation. The main types of ferry services are inland ferry services and sea ferry services. In the world many countries use ferries as a main transport mode. But in Sri Lanka it is difficult to find passenger ferry services although Sri Lanka is surrounded by the Indian Ocean and blessed with natural and artificial water ways. Resources are available inside the country to start a ferry service. Ferry transportation is going to be a new transport mode for the passengers. Identifying the passenger attitudes is important before implement this service. This research is about finding the passengers attitudes for a future ferry service from Colombo to Negombo.

In ancient times there had been good canal systems in Western Coast of the Sri Lanka. In the 8th century most of the trade activities and transport activities have done on those canal systems. Hamilton canal was completed in 1802 under the British Colonial Government. Because it is from Colombo to Negombo and it has a considerable distance. In the ancient times it was used for transport salt and other goods. And the Dutch canal is one of the canal systems which was repaired and used during Dutch era (Boyle 2013). From that canal system Old Dutch canal and Hamilton canal are parallel to the Colombo- Negombo road (Figure 1).



Figure 1- Negombo canal Padda boats

I. INTRODUCTION

Figure 1 show the boats which use for goods transportation in the ancient days. Name of these boats are Padda boats (Info Lanka)

The Colombo and Negombo are two cities which locate in Western coast of the country and population density of these cities are extremely high as Negombo population is 121,993 (Negombo Municipal Council,2014). The distance between these two cities is 38km and A3 highway and an E002 expressway connect those two centers. However, in the peak hours several main intersections get highly congested on the highway. Therefore, establishing a ferry service will increase the mobility to enter Colombo and other cities. There are two canals and it is a good opportunity to launch ferry service on one of those canals.

One of most important factor to be considered in introducing new service or product is the attitude of the customers towards that, because expectations of customers are different from one service to another. In ferry transportation services customer attitudes are mainly based on safety, reliability, comfort, and benefits. Inland ferry transportation is a new transport mode to Sri Lanka although ferries are used in tourist targeted places. If the expectations of passengers are identified correctly it helps to present a successful service. In the first place passenger will not have a trust on ferry transportation because it is new experience to use ferries instead of buses, trains, or other modes like private vehicles. So findings of this research can help to design a passenger friendly ferry service, then they would be like to shift to ferry service.

A. Problem statement

What is the attitudes/expectation of potential passengers regarding inland ferry service from Negombo to Colombo?

B. Objectives

Primary objective

Primary objective of this research is to identify the passenger attitudes and their needs which needed to implement a successful ferry service between Negombo and Colombo.

Secondary objectives

To find out the factors which passengers concern when deciding their mode choice in day-to-day trips.

To identify the boat types and facilities, match for the passenger attitudes.

To identify terminal locations, structures and route of the ferry service.

C. Hypothesis

- Quality of the boat service will improve the demand for boat service
 - Park and ride facilities, reliability of the service will increase the demand for service.
- D. Significant of the study

When starting a new transport mode, it is important gets the ideas of the potential customers as a market survey. How Sri Lankan people think about passenger ferry service was revealed through this study. Customer expectations have been identified to design the system requirement and service facilities.

II. LITERATURE REVIEW

A. Ferry service in Sri Lanka's context

According to History in 15th century, (King Veera Parakkama Bahu 8th era) there was a canal from Negombo to Colombo seaport. This canal was used to transport precious stones, pearls, and spices like cloves, cardamoms, pepper, areca nuts and cinnamon. (Infolanka 2014)

New Colombo Negombo canal (Hamilton canal) was built during 1802 and 1804 under the British colonial. This canal ran west of the Old Dutch canal from mouth of Kelani River at Hekitta to southern edge of Negombo Lagoon and distance is 14.5 km. After the recent reconstructions of this canal, now it is an eye catching environment due to the castle tower design, broad pavements and landscaping (Boyle 2013).

Colombo metropolitan area has a good waterway network. And ferry service can be implemented in this network can be help to reduce congestion in Colombo. (De Silva 2003)

When there is ferry service parallel the congested road, people will shift to the ferry service. Therefore, if a Ferry service can be implemented at Hamilton canal it will help to reduce the traffic congestion at Colombo - Negombo highway and it will help to reduce fuel consumption also. (Kahadawattaarachchi 2009)

Ferry service is implemented at Kirulapana canal. This service is from Nawala to Wallawatta and the fare is less compare to bus fare. This service is undertaken by Sri Lanka Navy. (Wijayapala, 2010)

In the ancient times there were ferry transportation taken place in Colombo Metropolitan Region. In those days, freight transportation was the mainly done through the waterway (De Silva 2003)

Nowadays one of main problem in Colombo Metropolitan Region (CMR) is congestion. Constructing roads and other infrastructure is not sufficient with the increasing traffic.

Therefore, transport planners have to think about the waterway system in the past. It will be a feasible alternative for expanding infrastructure (De Silva 2003)

According to De Silva (2003) there are five selected waterway system in Colombo Metropolitan Region which were identify as the technically feasible. And two from those five waterways; Kirulapona –Wellawatta and Biere lake are the selected as the most feasible routes for public transportation system CMR. Using wellawatte Canal the travel time from Wellawatte to Battaramulla can be reduced to 30 minutes and it is one of the best East-West connection in the Colombo District. (Sirisoma & Banadara, 2004)

The Hamilton canal is a source for develop eco-tourism. Therefore, Hamilton Canal project was started with the objectives of developing the Negombo Tourism Zone and protect the rich biodiversity of the area so protecting different species of fish, flora and fauna in and around the canal. With this development nearly 8000 people visit this area during weekends and this area has become magnet to tourism (DailyMirror, 2013)

B. Ferry services in other countries

Ferry transport services are popular in many North American cities like New York, San Francisco, Seattle and Vancouver. In those cities ferry services are essential part in urban transportation system. One benefit of ferry is, it an alternative to expensive infrastructure for cross water barriers. And also it offers an offer direct access to residential and business areas in low travel time than congested roads (Bruzzon 2011).

Dramatically increasing of ferry transportation in USA is an opportunity to plan ferry services systems which can spur the revitalization of their cities. New York ferry services are operated by both private and slate operators. New York water ways is a major private ferry operator they have their own bus service which connect to the ports. Therefore, their passengers can easily transfer among the modes (Weisbrod and Lawson 2003) Sea streak ferry which was runs from central New Jersey to Manhattan is offering seasonal tourist packages and special event. This service is a successful approach to attract more tourists. (Thompson et al. 2006)

In Bangladesh, they have a separate authority for in land water transport. This authority is established for development, maintains and control of inland water transport and in land waterways in Bangladesh. This country has rivers, streams and canals that together cover about 7% of the country's surface. In Bangladesh 50% of all arterial

freight traffic and one quarter of all passenger traffic is carried by the Inland Water Transport (IWT) sector (BIWTA) In Thailand IWT is second to the road in share of freight transportation. In numerically it is 20 million tons. Passenger ferry services can be seen in Bangkok, with different types of services which including express services also. (Rangaraj and Raghuram 2005)

India accepts IWT as viable mode of freight transport. In present they have three main national waterways (NW) in their country.

These waterways are; the Ganga- Bhagirathi- Hooghly system, Brahamputra system, The West Coast canal system. According their numerous studies, they argue in land water ways desirable and environmentally friendly mode of transport.

According to Rangaraj and Raghuram (2005) China has more than 100,000 kilometers navigable inland waterways and large number of inland port facilities with berths for large vessels. In addition, 10% of total freight transportation is done by IWT. So there is a significant use of this mode as a fright transporting.

C. Benefits of implementing ferry service

Ferry transportation help to increase the economic benefit for the surrounding cities. Ferry service can make attractiveness for the residents and visitors; this creates opportunity for economic development through business, waterfront residential, or tourism. They are to be integrated into transportation planning, be seamlessly integrated with land-side connections, be designed to maximize the economic development potential of their landings and terminals, be designed to have their environmental benefits maximized and their adverse environmental effects minimized, be designed to maximize safety and security, be designed possible carry freight (Weisbrod and Lawson 2003). Faster ferries have a possibility to shift passengers to ferries from land routes. Cost of ferry is not too high; have to be added to the costs of the subsequent mode of transport which may have to be used to achieve the end to end requirement of transport. And also having good inter mode transit facilities can attract passengers. This can be used for tourism and water sports also. (Rangaraj & Raghuram 2005)

a. Ferry Terminal

Ferry service is consisted with several elements like terminal building, vehicle holding and supporting area, terminal building, parking and customer signage (Washington State Department of Transportation). But main element in a ferry

terminal is passenger waiting area and dock (Brisbane river ferry terminal design competition 2011).

b. Ridership

There are few ridership types can be identifying in a ferry service. They are commuter who usually uses this mode, recreational riders who uses this mode as tourists and mix route which is for both above categories (Washington State Department of Transportation).

D. Tourism

According to Weisbrod and Lawson (2003) there are few ways of advanced tourism by ferry transportation. They are mentioned below.

- Access - Ferries willingly allow residents and tourists in waterfront areas access to downtowns and trip attraction for downtown areas. In the reverse direction, ferries will be carrying residents and tourists from downtown. Ferry service creates the opportunity for ready access to attractions on the waterfront.
- Promotion - Ferry terminals and the ferries themselves can be used to promote nearby places and events. Through this mechanism it will help to increase the passengers for the service as well as more tourists for that area.
- Attraction - The terminals themselves can be tourist attractions. Terminals can offer widely open spaces with waterfront views. Then it will become tourist destinations; because passengers will visit those places for spend their leisure time.
- Invention. Popular ferry lines can invent tourist destinations. The quality and feature of the ferry service is important to attract more passengers. Therefore, invention is important offer a specific service.

E. Importance of passenger attitudes

Customer satisfaction is the main point of marketing concepts and customer satisfaction measurements are the key points of evaluation of service. Although these measurements do not appear directly on a company's profit and loss account, it is a basic condition for corporate success. The process of evaluating customer satisfaction is based on customer satisfaction criteria, the design of a questionnaire to measure satisfaction on those criteria, the choice of which customers to interview, and the analysis and interpretation of the results (Gavalas 2006).

Gavalas (2006) mentioned, the passenger's attitudes are directly influenced by the quality of the service. If passengers are getting an expected quality of service, their attitudes towards that service also positive. The image of company or service is always affecting to the passenger's attitude. Maintaining service which expected by the passenger will increase the demand.

According to Wijayapala (2013), "The Sri Lanka Navy has taken measures for the safety of the passengers by providing each of them with on-board safety measures such as life-belts and jackets. Each craft is backed by SLN divers, life savers and medical personnel for the safety of the passengers."

III. METHODOLOGY

According to the research question this research depends on the passenger attitudes towards the future inland ferry service from Negombo - Colombo. Although there are two canals between these two cities still there is no any public ferry service. Aim of this research is to identify the expectations of the potential passengers regarding the ferry service, and identify whether there is a possibility to implement this service as a daily passenger transportation mode (in hands of customer attitudes) or tourism based ferry services.

Adequate passenger mode shift to the new service is required for a sustainable ferry service. In order to achieve that, passenger attitudes should be positive on using this service. Dependent variable of this research is passenger attitudes. And passenger attitude is based on the attributes of the service quality. As per the literature review, those attributes are safety, reliability, comfort ability, responsiveness, accessibility and affordability.

In the inland ferry services, the operators have taken plenty of safety precautions. Safety is a major concern in water transportation. In this research, one of the independent variables is 'safety' which impact on passenger mode shift. Attitudes related to safety are measured as terminal safety and safety during the boat ride. Reliability is one governing factor in any sustainable transport system. Since the service is not operating yet, factors of reliability are difficult to measure. Therefore, reliability was measured based on expected (potential passengers) frequencies, waiting time of the terminal for passengers, and travel time. Comfort was measured through the on-board facilities, facilities of the

stations and also expected service from the staff. Accessibility is the easiness of take part in a transport activity. In this case accessibility is measured through easiness to approach to the ports and availability of the boats at a port. Affordability is one of main factor which creates positive or negative attitudes on passengers. Therefore, through the expected fare ranges and from the pay method we identify how affordability plays in the ferry service. Economic feasibility assessment should be carried out to calculate the costs and find the exact fare. Therefore, comparing with the bus fare is the method that used in the questionnaire to get the potential customers attitudes towards the pricing.

A. Population and sample

As mentioned above this ferry service is from Colombo to Negombo and these canals can be utilized for both passenger routes and tourism based routes. Then this ferry service implemented for two types of passengers. The people who daily travel between Colombo and Negombo can use this service as substitute for congested highway or the expensive expressway. And the local and foreign tourists who visit to see the natural beauty of this water area and who like to have different experience by travelling on a ferry. Therefore, population of this research is the above two part of the passengers. Due to limited time frame the sample has taken as 75 people who travel between Colombo – Negombo. Questionnaire was given to randomly selected 75 people but received number of filled questionnaires was 60. The questionnaires distributed in offices, and some educational institutes. Sample is consisted with the people who are in different age ranges, different types of designations. The questionnaires have distributed in 10 institutes in Colombo.

A. Conceptualization

Conceptualization framework was developed based on identified factors for Independent variables.

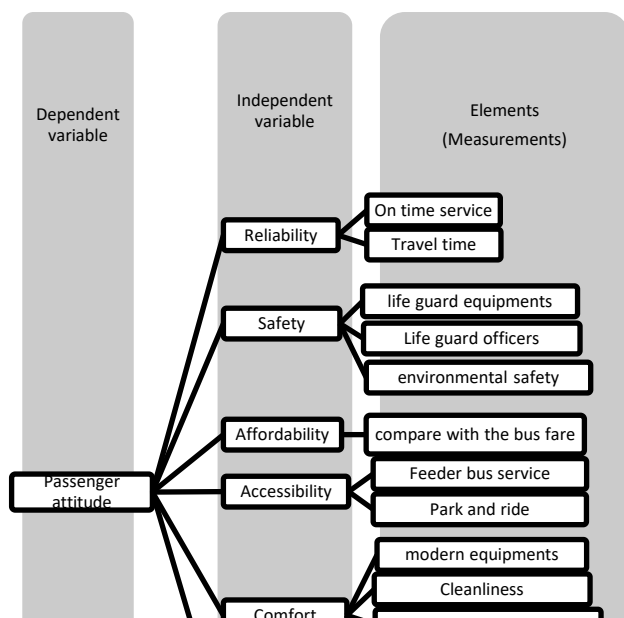


Figure 2- Conceptualization Framework

IV. RESULTS

Data was collected from a sample of 60 people randomly selected. Then the data was analysed by using SPSS software.

A. Demographic Data

From the sample there were 38% respondents who are in the 20-40 age category, 30% of the sample was in the 40-60 categories, 26.7% was in the less than 20 years' category and only 5% was in the more than 60 years' category. There were 29 male respondents and 31 female respondents.

B. Current travelling details

According to the present travelling pattern of the passengers in the sample, following are their frequencies of travel between Negombo and Colombo.

The most important category was the daily travellers, because they are the people who made more trips than the other categories. There were 45% of Daily travellers, 18.3% of weekly travellers, 31.7% of occasional travellers and 5% of tourists. When comparing the daily travellers and occasional travellers, both two categories does not have a drastic difference.

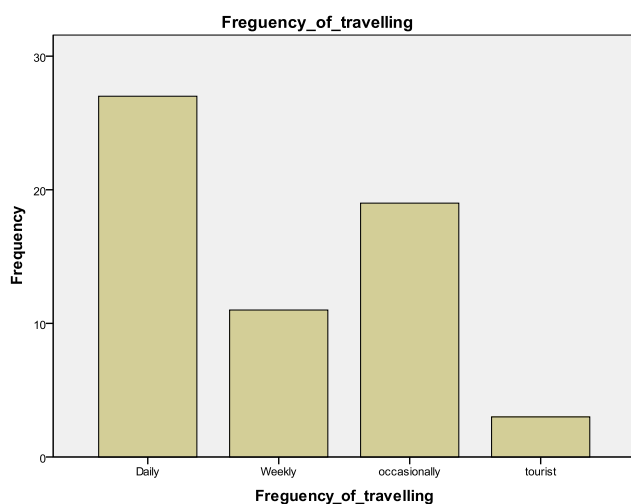


Figure 3- Frequency of travelling between Negombo- Colombo

According to their current travel mode, majority of the respondents in the sample travel on the highway, as a percentage 61.7%, secondly 20% of respondents travel on the expressway and only 18.3 travels by train.

Majority of the respondents in this sample are travel by a private vehicle (41.7%) and 18.3% by train, 36.7 % by bus. Therefore 55% of people are using public transportation.

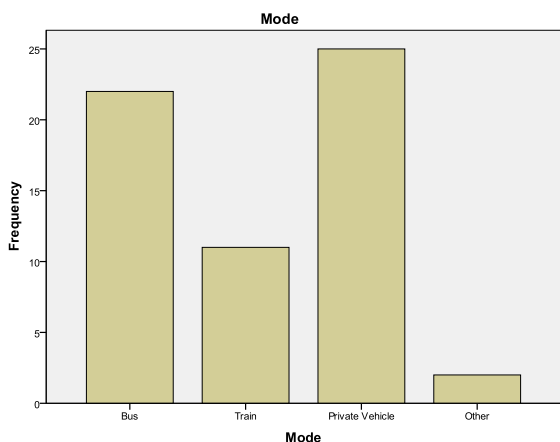


Figure 4- Mode of travel of sample

C. Reliability factor

Most of the respondents expect operations of the ferry service will be on the promise time. 51.7 % agreed and 33.3% strongly agree on this fact. Therefore, the success of this service is depending on the reliability and on time operations.

In this sample, 60% of potential passengers comment that they will use this service often and 21.7% mentioned they

travel always, if it takes less time than other modes. Majority of the potential passengers expect less travel time than other parallel modes. Hence speed of the boat and the type of the boat will be a governing factor in implementing this service.

D. Safety factors

When discuss about safety of a water related activity. Life guard equipment are also an important factor. This question is about the life guard equipment on the boats. All the respondents agree with this condition. 43.3% was agreed and 56.7% was strongly agreed with this. So they all consider about the safety precautions of the service.

As a safety factor when asked about lifeguard officers on the boat, all the respondents has agreed with this condition. 60% was agreed and 40% was strongly agreed with this.

Mentioning about the precautions and the safety assurance of the terminal, all respondents has agreed with this condition. 66.7% was agreed and 33.3% was strongly agreed with this. This is the relationship of the travelling frequency and the safety. 63.3% people mentioned that they would travel often if safety is provided. Therefore, majority of the people consider about the lifeguard equipment and the life guard officers during their journey in the ferry.

In the relationship of the travelling frequency and the safety of boat stations, 48.3% people mentioned that they would travel often if the safety is provided. Therefore, majority of the people consider about the boat station environment and conditions as well.

There were five questions related to the safety of the boat and according to the data all of the passenger expect the safety of this service.

E. Comfort factor

When discuss about the modern equipment and the outer appearance, some respondents did not agree with this matter. However, majority was agreeing that there should be modern equipment on boats with good overall appearance.

As total 83.6% were consider about the cleanliness of the boats.

The seating arrangement is mandatory to consider. When comparing with other public modes because 90% said that they are concerning about the seating facilities.

More than 88% was agreeing that boats should be equipped with proper sunlight covers. Although this is extra facility, majority of passengers expect a comfortable journey without direct sunlight.

70% of the sample was agreeing that boats should be equipped with rain covers. Passengers expect to travel without any inconvenience, so in the rainy days they expect a comfortable ride. Therefore, it is important equipped with rain cover for continuous service because majority of passengers are expecting this feature.

More than 90% of respondents agreed that the boat stations should be well managed. The appearance of the boats stations is also one reason behind the success of the service. According the statistics boats stations should be well managed, in order to attract passengers.

20% said that the conditions of the washroom or food stalls are not relevant to their decision on using ferry service. But 55% said with this condition they will travel often and 10% said they travel always.

F. Responsiveness

More than 81% expected a staff which always willing to help the passengers and 18.3% did not consider about this factor. According to this information, passengers expect better customer service from the staff. Therefore this fact will important when assigning staff for this service.

G. Accessibility

a. Park and ride

Most of the passenger said that they would like to use this service often, if park and ride facility will be provided. Therefore, it is important to consider this factor when implementing this service. When designing the boat stations in main cities which parallel to the canals such as Hekitta, Hendala, Bopitiya, Pamunugama, Seeduwa, Katunayaka, Pitipana and Negombo, there should be some space allocate to implement park and ride facility.

b. Feeder bus service

More than half of the sample commented that they expect to use this service often, if it is connected with a feeder bus service. And only 20% commented this facility is not relevant for their decision to use or not.

When comparing the feeder service and the park and ride service most of the passenger (50% of the sample) would prefer to travel by ferry often if there is feeder bus service.

H. Affordability

There were two questions regarding, passenger attitude regarding affordability. More than 58% comment that they will use this service often, if the fare is lower to bus fare. Passengers are expecting a financial benefit for shift to another mode also. Sometimes they may have to bear some additional cost to access boat stations.

When consider the pricing, travelling frequency will be considerably reduced with the high price than the bus fare. Most of the passenger will not like to travel by the ferry, if the fare is more than the bus fare. This issue will be very important when implementing this service. There is need for financial/ cost analysis to identify the implementing and operating cost and the fare structure.

As a summary following figure 5 describe how the potential passengers concern about the above factors.

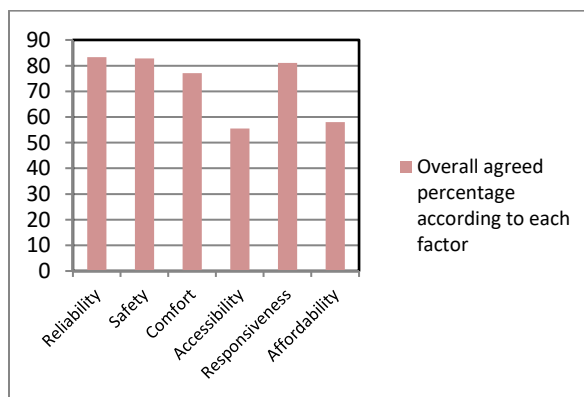


Figure 5 - Overall agreed percentage for each factor

I. Other

a. Payment term

Majority likes to pay by cash and it was 53.3%. Equally 23.3% like to use touch card method and season tickets.

b. Waiting time

All the respondents mention the waiting time should be less than 15minutes and majority 68.3% said it should be less than 10minutes.

c. Service provider

Majority of the respondents feel safer, if this service provides by Sri Lanka Navy. Therefore, if the service provider is Sri Lanka Navy, then it may be helpful to operate a successful ferry service.

The purpose of adding this question was getting an idea about the potential passenger awareness about ferry services. Majority of the respondents get to know about this service through internet and second most way was television. Therefore, passengers have a basic idea about ferry services.

c. Tourism

All the respondents like to experience this service as a tourist. There is a significant possibility to launch a tourism related ferry service.

71.7% said they would like to get a travelling experience through an ecological environment and only 28.3% said they may be.

More than 90% like to use a special tourist package and only 8.3% like to travel by normal package as a tourist. As a conclusion 51.7% said yes to use this service and 43.3% said may be. Only 5% said that they will not use this service. Demand will vary for this service according to the facilities provided. At the meantime there is a possibility to attract more passengers who comment was "May be"

V. DISCUSSION

A. Boat

Potential passengers are concerning about safety of the boat and the abilities of the staff. The respondents expect the on-board staff consisted with life guard officers. If life guard officers can be assign to the staff will be help to increase trust of the potential passengers and it will help to increase the demand. It is proposed to employ life guard officers and medical personnel to the staff as safety related recommendation. And the number of officers should be changed with the boat size.

Boats should be equipped with tubes and safety jackets. These jackets should be distributed to each passenger. And at starting each trip staff should give demonstration how to wear the life jacket and deliver the other safety related precautions.

There are several boat types for ferry service. Suitable boat types will change with the draft of the waterways, no of passengers and some other reasons. However, "Water Taxi" type will match the needs of this service. But water taxi has low capacity; these boats should be modified according to this service. Water taxi is one recommendation for selecting

the boat type. This boat is a lagoon craft type boat which made by Sri Lanka Navy for this special purpose. This service is new to the customers, so marketing is important to attract more passengers. Then visual appealing of the boat is important. Although safety, reliability and other factors are compulsory, in the marketing point of view boat appearance is playing a considerable role. Therefore, boats should have attractive appearance.

Most of the passengers expect to have a comfort travel in different weather conditions. It is recommended modifying the boat in order to travel comfortably in sunny days. In that case the boats with a roof will be sufficient. But for rainy weather the boats have to be more covered than having roof. Temporary covering system will not be suitable for rainy days. In side of the boats also be clean and well manage. And there should be comfortable seating arrangement.

B. Boat stations

Service and facilities of boat stations are also critical factor of attracting passengers for a ferry service. Safety expectations are one of main concern that found through the survey of passenger attitudes. Passengers expect a safety boarding and alighting facility at boat station. When planning the boat stations more attention should be given to berth facilities in order to assure the boats' safety and safety boarding and alighting for passengers.

It is better to have adequate facilities such as restaurant, washrooms, ATM machines etc. at boat stations. These facilities will not be needed for all boat stations. At least for the main boat station should be consisted with these facilities. It is important to have a small waiting area in each boat station.

To attract more passengers there must be intermodal connectivity to boat stations. The premises of boat station must have some parking space for the passengers who like park and ride facility. Feeder bus services which synchronized with the ferry schedule should be connected to the boat stations. The safety precautions should be display at the boat stations. It will help to aware passengers, how to behave in an emergency.

The locations of boat stations are important for provide a better service to the passengers. There are Old Dutch canal and Hamilton canal parallel to Negombo- Colombo highway. This research only covers the passenger attitudes and their

expectations. Therefore, the information is not enough to suggest the suitable canal and the exact locations for the boat stations. However, each main city should include with a boat station (Figure 6). As identified Hekitta, Hendala, Bopitiya, Pamunugama, Seeduwa, Katunayaka, Pitipana and Negombo are the main cities which needed to have boat station. The reason behind selecting these cities is their parallel location to the canals. When locating the boat station, population density of each area, existing transportation facilities to the station, distance between nearest boat stations and space (land availability) are the factors which should be considered. According to demand of these cities, land availability should be considered when deciding the locations.



Figure 6 - Hamilton canal and proposed boat stations

C. Operations

Fare collection is an important factor in a commercial service. Most of the passengers said that they do not use this service, if the fare is more than bus fare. The amount of the fares cannot be decided without an economical analysis. But it will be better if the price can be adjusted below or same range as bus service. There can be an expensive services with air conditioned boats for riders who wish to pay more for a better and comfortable service. Same boats can be used in tourism activities during off-peak time and at night.

Most of the passengers like to pay the fare by cash. Ticket counters should be implemented at every boat station. For daily passengers' season ticket is appropriate, because season tickets have a discount, so more passengers will be

attracting to the service due to the cost reduction. In addition, another recommendation to this issue is a multimodal electronic fare collection system. Then passengers can pay for bus and ferry via electronic card. The staff for fare collection can be reduced and it will be advantage to the operators also.

Reliability of the service is important to keep the demand. The recommendation is to conduct the operation according to a demand based time table. Punctuality and continuous service need to be ensured to maintain the reliability of the service.

Although potential passengers have idea about general ferry services, Present canal related ferry services are not familiar to them. There are some passenger ferry services in Sri Lanka, but potential passengers do not aware. Therefore, advertising campaign should be conduct after implementing this service. If this service can be operated by Sri Lanka Navy, it will help to generate more demand because people have a trust that safety will be better then.

D. Tourism

All of the respondents in the sample were like to travel as tourist. In the beginning passenger ferry service will not be profitable. It takes time to improve the demand. Therefore, in side of operator tourism related ferry service will be important to cover the cost. And passengers also have positive attitudes to travel as tourist. Most of the passengers like to travel in a special tourism package. Therefore, these boats and staff should be utilized in special tourist packages in off peak times, weekends and holiday seasons. Hamilton canal and Dutch canal both are gifted with bio diversified magnificent natural surroundings. Therefore, it is proposed to implement an eco-tourism package for the tourists. As a promotional activity, some water events or tourism events can be held during school vacations. Then it will help to attract more passengers.

VI. CONCLUSION

This research is about passenger attitudes toward implementing a ferry service from Colombo to Negombo. Success of a service related organization is depending on the passenger/ customers attitudes. Although most of the Sri Lankans aware about ferry transportation, they are not familiar with it. Therefore the attitudes of potential passengers will be help to implement the service according to their expectations.

Through the data gathering, most of the passengers have interest to travel ferry by service was the overall comment that got through this research. But the passengers expect boat with safety requirements, comfort and service on schedules. They expect safe boat stations, basic terminal facilities like snack bar, washrooms and waiting area. Park and ride facility and feeder bus service are also main expectation of the passengers and the decision to use this service or not are depend on this facility. Majority of the passenger expect the fare of this service will equal or less than the bus fare. Everybody in the sample prefers to experience the tourist packages and will be good opportunity to start such service.

The final comment of this research is, the attitudes of the potential passengers are positive and they would like to use this service. But the expectations and requirements of the passengers should be meeting with the future service in order to use it. Financial feasibility study is needed to identify the cost of operations. Feasibility studies for both canals also need to conduct in order to identify the appropriate canal and the modification and also demands from the cities between Colombo- Negombo is important to decide places of boat stations and feeder services routes. Finally, as the hypothesizes, the frequent of using a ferry service is depended on the quality of the service and reliability, park and ride facilities will be help to increase the demand of the service are the main outcomes of this research. Therefore, when implementing the service, it is important to focus on the passenger attitudes.

ACKNOWLEDGMENT

I would like to express my sincere gratitude to my research supervisor Dr. Namali Sirisoma, for her immense support and guidance to success this research.

REFERENCE

Boyle R. (2013) The Hamilton canal a past and future waterways <http://exploresrilanka.lk/2013/09/the-hamilton-canal-a-past-and-future-waterway> (accessed on 20/12/2014)
 Brisbane river ferry terminal design competition (2011) Brisbane in a New era of transportation
 Bruzzone A. (2011) TCRP Report 152, Guidelines for ferry transportation services, Transist corporative research program.

Daily Mirror (2013) <http://www.dailymirror.lk/travel/travel-tips/37578-hamilton-canal-a-magnet-for-ecotourism.html#sthash.xShFh3yj.dpuf> (accessed on 20/12/2014)

Daily News (2002) The Hamilton Canal – how it came to be, Daily News Friday May 17 2002.

De Silva G.L.D.I. (2003) The study of the feasibility of water transportation in Colombo metropolitan region, Department of Civil Engineering, University of Moratuwa, Sri Lanka.

Department of economic development (med), <http://med.gov.lk/english/?p=15336> (accessed on 20/12/2014)

Gavalas E. (2006) Customer satisfaction in Greek coastal shipping services.

Info Lanka, <http://infolanka.com/org/srilanka/hist/hist11.html> (accessed on 20/09/2014)

Kahadawattaarachchi T., (2009) Innovation the forward, http://businesstoday.lk/cover_page.php?article=1608&hl=hamilton%20canal (accessed on 20/12/2014)

Kannangara D. (2010) <http://exploresrilanka.lk/2013/09/the-hamilton-canal-a-past-and-future-waterway/> (accessed on 20/09/2014)

Macmilan Dictionary <http://www.macmillandictionary.com/dictionary/british/attitude> (accessed on 13/12/2014)

Negombo Municipal Council Population Statistics, <http://www.negombo.mc.gov.lk/Municipal.html> (accessed on 23/05/2016)

Peiris K. (2012) Dutch canals in Sri Lanka, Sunday Observer <http://www.sundayobserver.lk/2012/06/17/spe04.asp> (accessed on 13/12/2014)

Rangaraj N. & Raghuram G. (2005) Viability of Inland Water Transport (IWT) in India, Indian Institute of Management, Ahmedabad.

Sekaran U. and Bougie R. (2012) Research methods for business, fifth edition, John Wileys and son Inc.
Sirisoma R.M.NT., Bandara J.M.S.J., (2003), *Transport Study on Proposed Canal Transit mode on Wellawatte Canal*, Infoconsult Inc. Toronto, Canada

Sri Lanka Navy, < <http://whalewatching.navy.lk/> > (accessed on 02/12/2014)

Thompson R., Burroughs R. and Smythe T. (2006) Exploring the Connections Between Ferries and Urban Form: Some Considerations before Jumping on Board, *Journal of Urban Technology*.

The International Bank for Reconstruction and Development (2011) Energy efficient inland water transportation in Bangladesh.

Transit Capacity and Quality of Service Manual—2nd Edition, Chapter 6

Washington State Department of Transportation (2014), Terminal Design Manual, terminal engineering department.

Washington State Department of Transportation, Ferry Division Terminal Design Standards

Weisbrod R.E. & Lawson C.T. (2003) Ferry Systems: Planning for the Revitalization of U.S. Cities *Journal of Urban Technology*.

Wijayapala R. (2010) http://www.defence.lk/new.asp?fname=20101012_02 (accessed on 11/11/2014)

Wijayapala R. (2013) Diyawanna boat service highlights beauty of the parliament, *Sunday observer* 10/02/2013.

AUTHOR BIOGRAPHY

Author 1



Lt DAR Chaturanga has joined to the Naval and Maritime Academy in 2010 as an officer cadet and commissioned in 2012. He is an undergraduate of BSc in Logistics Management (specialized in Transport Management) at General Sir John Kotelawala Defence University.

Author 2



Dr. RMNT Sirisoma is a Civil Engineer by profession and has obtained her first degree from University of Moratuwa. She has obtained her PhD in Transportation Engineering from the same university. She has worked as a Research assistant in University of Hong Kong, Honk Kong Polytechnic University. She has worked as a post-doctoral fellow in University of Calgary Canada and Aerodrome Engineers (Design & Standards) in Civil Aviation Authority of Sri Lanka. At present she is the Head of the Department of Department of Management & Finance in General Sir John Kotelawala Defence University. Her research interests are Public Transport, Airport Planning & Operations, Transport Network analysis and Disaster Management.