IMPACT OF TRANSPORT INTEGRATION INITIATIVES OF KMRL ON

YOUTH: A STUDY WITH REFERENCE TO ERNAKULAM

Dissertation submitted to

St.Teresa's College (Autonomous)

(Affiliated to Mahatma Gandhi University, Kottayam)

In partial fulfillment of the requirement for the degree of

MASTER OF ARTS in ECONOMICS

By

POORNIMA.S.MENON

Register No: AM21ECO012

Under the Guidance of

Dr. MARY LIYA C A

ASSISTANT PROFESSOR

DEPARTMENT OF ECONOMICS

ST.TERESA'S COLLEGE

ERNAKULAM

MARCH 2023

<u>CERTIFICATE</u>

This is to certify that the Project titled **"IMPACT OF TRANSPORT INTEGRATION INITIATIVES OF KMRL ON YOUTH: A STUDY WITH REFERENCE TO ERNAKULAM"** is a record of the original research work conducted by POORNIMA.S.MENON (Register No: AM21ECO012) under my guidance and supervision in partial fulfillment of the requirements for the award of the degree in Master of Arts in Economics **(Affiliated to Mahatma Gandhi University, Kottayam**). The research work has not previously formed the basis for the award of any Degree, Diploma, Associate ship, Fellowship or any other similar title and it represents a contributory work on the part of the candidate.

Dr.Mary Liya CA   **Dr. Mary Liya CA**

Head of the Department   Guide and supervisor

DECLARATION

I hereby declare that the Project titled **"IMPACT OF TRANSPORT INTEGRATION INITIATIVES OF KMRL ON YOUTH: A STUDY WITH REFERENCE TO ERNAKULAM"** submitted by me for the M.A. Degree in Economics is my original work and this work has not been previously formed the basis for the award of other Academic qualification, fellowship of other similar title of any other University or board.

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Course of Study	M.A. Economics
Name of Guide	Dr. MARY LIYA C. A.
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ACKNOWLEDGEMENT

First and foremost we thank God Almighty for the strength, blessings and hope showered upon me to carry on and complete the project.

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extent my sincere thanks to all of them.

I express my deep sense of gratitude to my supervisor Dr.Mary Liya CA, Assistant Professor and Head of the Department of Economics, St. Teresa's College, Ernakulam for the constant guidance, close supervision and kind inspiration during this project work. I thank her again for the valuable advice and encouragement extended by her. I also thank each and every member of the faculty of the Department of Economics, St.Teresa's College, Ernakulam for their advice and valuable suggestions for the successful completion of this study.

I duly thank all the respondents of our questionnaire for answering the questions patiently. Last but not the least I would also like to thank my parents and friends who helped me a lot in finalizing this project within the limited time frame.

Poornima.S.Menon

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CHAPTER 1

1.1 INTRODUCTION

Public transportation, often known as mass transit, is a kind of group travel system that is open to the general public and typically operated on predetermined routes with posted fares for each journey. It is typically administered on a timetable. Around us, there are numerous public transport options including ferries, passenger trains, rapid transit, light rail, city buses and more.

Rapid transit, sometimes known as the metro, is typically electric and offers services between stations along specified lines utilising electric vehicles on railway tracks. They are often operated by an identical public transportation agency and linked with other forms of public transportation. Because of their built-in safety features and tight restrictions, rapid transit systems have exceptionally low accident rates when compared to other forms of public transportation. They have acquired a high score on the safety end as an effect.

The combination of its specialised infrastructure, high capacity, urban coverage, safety, and interaction with other modes, Metro has become one of the most efficient transportation systems in the world.

Metro rail is a quick and effective means of transportation that can also accommodate a big number of passengers at once in a country like India where everyone is pressed for time. When loaded to capacity, it requires 1/5 to 1/6 the energy per passenger kilometer (PKM) of any road-based system.

The Kochi metro owned by KMRL is a rapid transit system in the city of Kochi. It's a unique project that aims at integrating rail, road and water transport facilities. Construction work of the metro began in June 2013 and it was opened to the public in June 2017 by Shri Narendra Modi, the Prime Minister of India.

Due to its distinctiveness Kochi metro has won several accolades since its installation, like being named as the Best Urban Mobility Project in India by the Urban Development Ministry, as a part

of the Urban Mobility India (UMI) International Conference[1]. It was also one of the fastest completed metro systems in the country[2]. Kochi metro employs kudumbashree workers and members of the LGBT community, hence making it the world's 1st transit system where the management operations are handled by women[3].

The entire project was mapped out in 3 phases. Phase 1 is from Aluva to Thripunithura, which is a stretch of 36.8 km. There are 25 stations spread across this distance, out of which 24 are operational i.e. from Aluva to SN junction. The 25th station in Thripunithura is currently under construction. Phase 1 of the metro project was estimated to consume ₹ 5181.79 Cr but later this was revised to ₹ 5687.79 Cr in 2019 due to various factors.

Phase 2 will link the JLN stadium to the infopark which is an 11.2 km stretch with 11 stations. The budget estimate put out for this part of the project is ₹2577 Cr. Phase 2 was approved by the state cabinet in May 2017 and is currently in "under construction" status.

Phase 3 of Kochi Metro will extend towards Angamaly, therefore linking the Aluva station to CIAL (Cochin International Airport Limited). This phase is still being planned and is in line to be approved. This particular phase of Kochi Metro is very important as it provides a traffic free, timely and economical linkage between Ernakulam city and the airport which on other travel mediums would take 55 minutes at minimum.

The Kochi metro rail has a total of 25 trains. 21 of the trains are named after the rivers in India and the rest 4 were given names related to the wind. The trains have a total length of 66.55 metres or 3 coaches that has the capacity to carry upto 975 passengers at a time and travels at an average speed of 35 km/hr. The coaches were manufactured under the "Make in India" initiative by Alstom, they were entirely designed and manufactured in India.

KMRL offers an automatic fare collection system with a combination of smart cards and RFID (radio frequency identification)/ QR (quick response) tickets. The latest inclusion to the ticket purchase is the KOCHI 1 app. This app allows users to buy tickets through e-commerce as well

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[1] "Kochi Metro zooms past Chennai, Nagpur to emerge best". *Malayala Manorama*. 31 October 2017. Retrieved 3 November 2017.

[2] "Kochi Metro creates national record". Deccan Chronicle. 14 March 2017. Retrieved 30 July 2017

[3] "Facility management centre gets SKOCH award". *The New Indian Express*. 3 October 2018. Retrieved 4 October 2018.

as top up their KOCHI 1 smart cards online, thus reducing the line at the stations, saving time and also providing contactless services in the wake of the Covid 19 pandemic. There has also been installation of ticket vending machines, another contactless ticket booking service at the stations. The metro is managed by women, who are majorly members of the women self help group "Kudumbashree". The company also hires members of LGBT community. Together these women manage customer relations, housekeeping, parking services et cetera at the stations.

KMRL has proven to be a pro earth enterprise, not just through use of renewable energy but also through the innovative set up of vertical gardens. Particular stations have pillars which have been converted into gardens by utilising biodegradable waste from the city instead of soil as a part of being connected to the Swachh Bharat Mission. They are watered through drip irrigation thus saving water as well.

Kochi Metro has helped connect the city to a huge extent by helping people get on time to the busiest parts and economic zones of the city without having to go through the hassle of being stuck in traffic, but there are locations it still has to connect to. One such major point would be CIAL and until phase 3 is completed people have just the road transport to get to the airport. Certain other important location metro has left out of its coverage is the high court junction, marine drive and boat jetty. It's important to note that these are points of extreme economic importance to the city and due to this lack of coverage the Metro was losing about ₹300 Cr annually. So in order to widen its coverage metro has come up with a few last mile connectivity measures. They have joined hands with KSRTC to provide feeder services from certain important metro stations like MG road, Maharaja's and Ernakulam south Metro stations. The Pavan-Doot Airport Feeder Bus Service is a fleet of e-bus that KMRL intends to roll out. As of now there are 2 e-buses that operate between Aluva metro station and Cochin International Airport (CIAL), though it's essential to mention that there's a high demand for increased service frequency between these 2 points. Another step from KMRL to improve connectivity to specific locations at an economical rate is the "my bike" facility. Through this people can borrow bicycles from metro stations at extremely low charges and use it to get across the city where other transport facilities could possibly not take you or prove to be too expensive. Access to this service can be availed from the "MYBYK" app. Apart from this KMRL has connected with Ernakulam Jilla Autorickshaw Drivers' Cooperative Society (EJADCS) in order to provide connectivity services with the help of e- autos. These are shared autos, so they are much less

expensive than the usual personal autos one would take. As far as the first and last mile connectivity is concerned, it can't go unsaid that many of the metro stations have bus stations right next to them, thus giving the passengers always a cheap mode of transportation to easily get into the city, until the metro's smart, clean and integrated services are completely operational.

Speaking of integrating transportation, KMRL's plan for Kochi does not stop at just Metro rail. Its aim is to integrate road, rail and water transportation. Kochi is pivotal to Kerala's economy and is connected through a network of inland waterways, but water transport facilities are not well developed both in terms of investment and technology. KMRL's Water Metro is an energy efficient inland water transport facility that will connect 10 islands with 15 identified routes that span over 78 km. There's a plan to commission 78 electrically propelled hybrid ferries to connect 38 jetties. This project will lead to social inclusion of people on remote islands, benefit the tourism sector and will lead to considerable reduction in the emission of pollutants.

The measures of connectivity will be consolidated by all means with the help of the smart cards, Kochi 1 app and the MYBYK app. The cards are not just metro cards; they are prepaid cards that can be used for travel in metro (rail and water), buses, and availing parking facilities and for shopping and paying bills. The Kochi 1 app on the other hand allows users to book tickets online, top up their smart cards and plans their entire journey in advance. The MYBYK app allows users to use a bike from any hub with digitised payments, providing an affordable commute to every user without any inconvenience. The launch of Kochi 1 app that allows users to access e- QR tickets for the services along with the smart cards and travel passes is a promotion of digitalisation and an addition to the Government of India's highly endeavoured cashless economy and Digital India initiatives.

1.2 STATEMENT OF THE PROBLEM

KMRL has been operating in the city of Cochin since 2017. Since its installation, the company has undergone several critical changes in many aspects. The number of stations, quality of services, spectrum of services etc has all increased over these years. They are in every sense taking steps to integrate transportation in the city.

It's imperative to know that many of Kochi Metro's initiatives are analogous to a number of national campaigns and pro earth strategies. Metro's promotion of ticketless transportation,

digitised payments and free wifi easily is a step that aids the country's Digital India Campaign. The vertical gardens, electric autos, buses, shared cycles, usage of solar power and water metro has helped advance the green and pollution free city campaigns.

It's important to note that even with these action plans to draw in people, the metro has not been able to become the top most preferred mode of transportation for the majority in the city. This would include a lot of issues, like lack of coverage to the high economic zones of the city and ease of using other public transport mediums, the hassle of taking public transport etc. Therefore, in this project we intend to analyse the extent to which people in the city utilise the initiatives rolled out by metro to truly integrate the entire transport system of the city. This would include both integration of the different mediums of public transportation and also the method of paying for it. The targeted population will be the youth in the city i.e. people between the age of 18 to 35.

The project will be focused on the impact of these initiatives on youth in the city. Through the study, we can find the level of digitalization KMRL has been able to achieve among a sample of the youth population i.e. the frequency of usage of cashless payments and ticketless travelling in the metro system. This will be achieved by gaining a clear understanding of the extent to which people know about the digitalization initiatives of the metro and how far they actually make use of it.

It has been noticed that Kochi Metro makes use of a number of pricing strategies to attract more customers. The project aims to look into the effect these strategies have on the youth and to what extent people respond to these schemes.

Another important object of exercise would be to study the response of the youth towards the last mile connectivity measures of the KMRL. Integration of transport in the city, which is the vision of KMRL, is one that can be achieved when it enables people to travel to their exact desired location in a connected manner, which is why metro stations have parking facilities, feeder buses, and electric autos and shared cycle. To what extent people utilize these facilities will decide the possible success of this system, which is exactly what the project is taking up to analyse.

1.3 REVIEW OF LITERATURE

1. Ashwathi.P and Anju Wilson (2020)[4] have stressed on the need to introduce a light Metro system in the city for mass and rapid transportation as the city undergoes massive development and thus have focused their study on factors that is affecting the performance and delay of the construction project of Kochi Metro. The success in performance is mainly owing to the speedy approval, work ethics, delegation of powers, technical expertise et cetera. 25 factors were observed in total and delay in land acquisition and site handover to contractor were seen to be the major delay causing elements. Weather was also seen to be a major cause of delay in Kerala. The effects of these delays were time overrun, cost overrun and arbitration.

2. Govind.V, Lijo.K.Thomas and Dr.A.S.Ambily (2017)[5] have studied the opportunities, challenges and impact of the metro from the public's point of view. 76.5% of the people thought that metro would reduce traffic, 58.8% saw metro as a chance of increasing employment. Metro was considered to be helpful for improving infrastructure and for the overall progress of the city by 27.5% and 59% of the respondents respectively. But 74.5% of the people have said that metro construction has led to an increase in pollution. It was noted in the study that people would like the work to be completed at a faster pace and this development should be carried forward in an environment friendly and economical way.

3. Dr. Shamsi Sukumaran Kunnathully (2021)[6] in his study had noted that most people were optimistic about the metro as in cities like Cochin where the roads are narrow metro can help

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[4] P, Aswathi, and Anju Wilson. "Study on Critical Performance Factors Affecting Kochi Metro Rail Project." *International Journal of Advances in Scientific Research and Engineering (ijasre)*, vol. 6, no. 5, 2020, pp. 107-112.

[5] V, Govind, et al. "THE KOCHI METRO OPPORTUNITIES, CHALLENGES AND IMPACT ON PUBLIC: A STUDY AT ERNAKULAM DISTRICT." *Journal of Advanced Research in Dynamical and Control Systems*, vol. 9, no. 5, 2017, pp. 66-73.

[6] Kunnathully, Dr.Shamsi Sukumaran. "A Study to identify the factors influencing passenger satisfaction towards Kochi Metro Rail Ltd and its Services." *INTERNATIONAL JOURNAL FOR INNOVATIVE RESEARCH IN MULTIDISCIPLINARY FIELD*, vol. 7, no. 6, 2021, pp. 109-117.
Thomas, Nithin Ninan. "A STUDY ON THE POPULARITY OF KOCHI 1 SMART CARD." *Journal of Emerging Technologies and Innovative Research (JETIR)*, vol. 8, no. 2, 2021, pp. 202-227.

people reach places faster reducing their travel time by 50-75% , but they also thought that construction should take place at faster pace. The study clearly suggests an urgent need for a light metro system that can carry 25,000 as a fast , safe and economical mode of mass transportation as the city is rising in population and the travel demand is also rising people have to be provided with an efficient system of public transportation . This is because people will have a tendency to shift towards private modes of transportation as public modes become insufficient which will lead to more traffic congestion. The light metro on the other hand can help address this problem and keep it under control for at least the next 25 years.

4. Nithin Ninan Thomas (2021)[7] Studied the popularity of the Kochi 1 smart card and found that the innovation was being well utilised by the public.Data from both KMRL and Axis bank shows that only 7268 cards had been issued. Further analysis showed that many people were not aware of such a facility and its perks. This is mainly due to low scale promotion. The popularity of the card has scope of increasing upon increasing the promotional campaign.

5. M. Akul Nair, A. Sofi, V. Kannan (2018)[8] study proposes the addition of a platform providing the possibility of addition of train cars and hence more people being transported .Addition of platforms provides increment in the capacity of passenger flow during peak hour peak direction traffic. It was found that extension can be done using plate girders for elevated structures and the time required for this would also be minimal.

6. Rejivas.V.A, Bindhu.B.K, Bino I.Koshy (2014)[9] studied the road safety during the Kochi metro's construction stage.it was observed that fatalities and injuries along the Aluva to Petta stretch increased with metro construction. The accidents took place at peak hours and at night. The major safety issues spotted in the audit were inefficient street lights and presence of potholes, insufficient warnings and concrete elements from the construction left on the road,

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[7]

8 Nair, M.Akul, et al. "Extension of Existing Platform of Kochi Metro to Accommodate More Train-Cars." *International Journal of Engineering & Technology*, vol. 7, 2018, pp. 59-63.

9A, Rejivas V., et al. "Road Safety Audit of Kochi Metro During its Construction Stage." *International Journal of Engineering Research & Technology (IJERT)*, vol. 3, no. 11, 2014, pp. 1322-1327.

parking of vehicles in no parking zones etc. essentially the only solution is proper road maintenance .The other remedies for reducing the accidents are to make the visibility of road by cutting the branches of trees, cutting of the concrete projections, removing of unwanted sand deposits near the road.

7. Sibi.K.I (2016)[10] studied the impact of the metro rail construction on the local shop owners and the hazards faced by them. It was observed that the construction had led to a reduction in the number of consumers due to difficulty in accessibility. The hazards caused were mainly traffic issues, dust related health issues and lay off of staffs. There were also many parking related problems as well as environmental problems caused.

8. Nandhu Prasad (2018)[11] The report has discussed in detail on the construction aspect of the project, need for the metro, its advantages, technical intricacies, study of the construction drawings as well as the contracts, its safety aspects and site visit.

9. M.Ramachandran (2011)[12] has discussed the different phases of the project implementation from the proposal to implementation. The project proposal was submitted in 2005 and the state government was looking for various finance options like build-operate-transfer (BOT) and public-private partnership (PPP),but BOT was not feasible until the operator was given at least 14% equity and this will require funding to the extent of two third of the entire project cost according to the financial analysis.

10   K.I, Sibi. "A STUDY ON THE PREDICAMENTS FACED BY COMMERCIAL ESTABLISHMENTS IN KOCHI DURING METRO CONSTRUCTION." *International Journal of Research and Analytical Reviews (IJRAR)*, vol. 3, no. 3, 2016, pp. 690-696.

11   Prasad, Nandhu. "A Study of Infrastructure Development and Management of KoMet (Kochi Metro Rail Limited)." *International Research Journal of Engineering and Technology (IRJET)*, vol. 5, no. 5,2018, pp. 1621-1633.

12   M, Ramachandran. *Metro for Kochi, Metro Rail Projects in India: A study in Project Planning*. 2011. *Oxford Academic*.

10. Times of India (2022)[13] The article talks about Kochi metro's efforts to offset the loss in revenue it's been facing by promoting the usage of mobile QR tickets among passengers. To attract more people into the digital circle KMRL has come up with discounts on original fare for the mobile QR users. The target initially was to achieve a 100% digitalization by completely stopping the existing paper ticket system by December 31st, as Kochi metro is one of the few metros in India that's still using the paper system. The company hopes that promoting digital ticketing; enhancing paperless and contact free ticketing will attract more commuters into the metro chain.

11. Onmanorama (2022)[14] KMRL has installed free wifi in association with Worldshore for all of its users as a part of promoting the Digital India Campaign. This enables the commuters to surf the internet, work and entertain freely and safely during their travel between Aluva to SN junction.

12. Urban Transport News (2022)[15] The article talks about KMRL's plans to launch a truly integrated transport system for the city of Cochin. The company aims not just at integrating the entire transport system in the city through metro, buses, autos and water metro, but completing that with a single payment method for accessing these services. This is expected to increase the footfall in the metro and at the same time promote other transport mediums too. The vision is a single card and a new mobile application for the new transport system.

13. The Hindu Business Line (2021)[16] The article provides an insight into the status of the water metro in Kochi. Cochin Shipyard, which is incharge of construction of the boats have delivered the 1st set of battery boats to KMRL. The boats have an aluminium hull and are powered by LTO batteries. The metros are hence safe, stable, technologically ahead and extremely climate friendly. The launch of the water metro will be a great addition into the integrated transport chain that KMRL has been trying to create.

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13   "Revenue loss: Kochi Metro to go fully digital to woo passengers." *Times Of India*, Dec 2022.

14   "Kochi Metro launches free wifi in trains." *Manorama*, 12 October 2022.

15 Pandya, Naomi. "Kochi to implement integrated transport system for all modes of public transport." *Urban Transport News* [Kochi], 30 November 2022.

16   The Hindu. "Cochin Shipyard starts delivery of electric boats for Kochi Metro Rail." *Business line*, 31December 2021.

14. Deccan Chronicle (2019)[17] KMRL has joined hands with Axis bank for providing their passengers with Kochi 1 card that's not just a metro card, but also one that can be used to travel in private city buses. They procured 500 specially made ticketing machines for this purpose. Additional machine procurement is expected in the near future.There were some hiccups related to printing time and automatic battery conservation during initial usage , but it was corrected. The card is to be made suitable for extended usage across metro rail, buses and also water metro . The aim is to make sure that people can travel in various mediums using a single payment mode.

15. Mint (2021)[18] The article talks about KMRL's Public Bike Sharing system. MYBYK app allows the commuters to register themselves and start making use of the cycles from the docking stations underneath metro buildings. This will help commuters to rent cycles to get to the desired locations at extremely low prices. The system allows users to ride any bike at any time for a refundable fixed amount and choose a plan from 3 different economically priced schemes. In order to make the last mile connectivity stronger , Kochi Metro allows users to carry their own cycles in the metro free of charge. The target is to promote the usage of cycles in the city.

16. Dr.Vineeth.K.M and V.Chithra Menon (2018)[19] has conducted a study to understand the usage perception and consumer satisfaction of KMRL. The data was analysed using both descriptive and inferential statistics. It was found out that people seemed to be using KMRL services more than twice a week. Except among young people, the satisfaction level among commuters was found to be high. Consumer perception was seen to be pretty high as far as the role of KMRL in the economic development of the city is concerned. The study has been able to find out that the 2nd phase of KMRL is expected to bring more regular users and increased usage, thus contributing to a pollution free city.

17   K.E, Krishna Kumar. "Kochi-1 card for buses, too." *Deccan Chronicle*, 14 February 2019.

18 "Kochi Metro launches public bike sharing system. Here's how to book a ride." *Mint*, 14 May 2021

19 Menon, Chithra V., and Dr. Vineeth K. M. "Consumer perception and satisfaction towards KMRL services." *ZENITH International Journal of Multidisciplinary Research*, vol. 8, no. 7, 2018, pp. 25 - 33.

17. Sonia John Markose (2018)[20] has discussed the development strategies used by KMRL to make itself a prominent brand name. The study discusses revenue generation, branding, aesthetics and communication strategies used by metro to make it a unique service provider. Their Kochi 1 card, mobile app, usage of solar energy, MYBYK app, pillar gardens, awareness campaigns etc is what makes the system stand out. The paper has concluded that with green, gender, consumer and worker friendly methods, Kochi metro has become an emblematic business model in the state.

1.4 OBJECTIVES

1. To find the extent of digitalization (ticketless travel and cashless transactions) of metro rail transportation among youth in Ernakulam city.
2. Popularity of the different pricing strategies used by KMRL that is meant to boost integration of services among the youth.
3. To study the benefits of KMRL's additional transportation services and frequency of its usage among the youth population.

1.5 THEORETICAL FRAMEWORK

1.5.1 DIGITAL INDIA

Government of India launched the digital india campaign in 2015 to digitally empower the citizens of India in the domain of technology. The purpose of the initiative is to make sure that government services are available to citizens electronically by improving the online infrastructure and enhancing internet connectivity. The focus of the initiative is on provision of digital infrastructure as a source of utility to every citizen. It was established with a vision of inclusive growth in areas of electronic services, products, manufacturing and job opportunities. Digi locker, E-Hospitals, E-Pathshala and BHIM (UPI) are some of the important initiatives of Digital India. Since the launch of this initiative India has seen an increase in the number of electronic transactions, e- governance, coverage of optical fiber network and internet penetration in rural and urban areas.

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20 Markose, Sonia John. "EXPLORING AND EXPERIENCING KOCHI METRO: AN ANALYSIS OFTHE PERSUASIVE DEVELOPMENT STRATEGIES IMPLEMENTED BY KMRL." *DISCOURSE*
Xaverian Research Journal, vol. 6, 2018.

1.5.2 DISCOUNT PRICING

Discount pricing is a kind of promotional pricing strategy where the original price for a product or service is reduced with the aim of increasing traffic, moving inventory and driving sales. People are drawn to the lower price because consumers love feeling as if they are scoring a good deal. Discounting strategies also create a sense of urgency that might drive more customers to convert.

There are 3 main types of discounts:

1. **Seasonal**: businesses offer promotional discounts on seasonal goods or during particular seasons. This is sometimes even used to sell out-of-season merchandise.

2. **Clearance**: the word clearance is used by businesses to indicate that their products are for sale at an unusual discount. These sales are usually for a limited time period.It's usually offered by retailers to clear the discontinued products with the hopes of liquidating what's left in stock.

3. **Volume**: a volume discount incentivizes customers to purchase goods in multiple or large quantities . Bundling is a popular form of this type of quantity discount. Stores and service providers reward people buying in bulk or subscribing to something for a prolonged period. They provide such people with a reduced price.

1.5.3 PEAK LOAD PRICING

Peak load pricing strategy is the one wherein a high price is charged for the goods and services during the times when demand is at its peak. This type of pricing is based on efficiency and is used mostly for non storable goods like electricity, transport , telephone etc. these are the goods that can't be stored and hence their production is required to increase to meet the increased demand. Thus the marginal cost is also high during the peak periods as the capacity to produce these goods is limited. Therefore service providers set their price at the highest level with an aim to shift the demand or at least the consumption of goods and services to attain a balance between demand and supply.

1.6 METHODOLOGY

The study is based on both primary and secondary data. Primary data was collected with the help of a questionnaire. It was sent around to targeted groups of people between 18 to 35 years of age

as they are the group we have classified as youth .The research contains a sample size of 52 individuals.

The respondents for the study were selected on the basis of convenience sampling technique. In these, participants were selected based on their availability and willingness to participate. For statistical purposes UN use the age group 15- 24 as youth. However there is no universally agreed international definition of the youth age group. Therefore for this study we have modified the age group to include people between 18 to 35 years of age to get a satisfactory percentage of students, working as well as the non working population.

The questionnaire was a tool to collect data to assess people's response to KMRL'S different Digitalizing initiative, pricing strategies and transport integration initiatives.

The secondary information was collected from published materials like KMRL annual reports, journals, magazines, newspapers, research papers, websites etc.

The collected data has been analysed and represented using simple statistical tools such as tables, percentages, diagrams, charts and rank. These tools have been used to represent various preferences of individuals regarding the payment methods, tickets, discounts and last mile connectivity measures. The tools have been used to analyse and draw inferences about the impact various digitalising and transport integration initiatives has on youth and extent to which they use it.

To analyse the impact of these initiatives on individuals, the project has used variables like age, occupation, frequency of using the metro, most frequented stations, preferences and awareness regarding tickets, payments, price schemes, last mile transport service and water metro. To analyse the factors that influenced people's level of digitalization and utilisation of extended services, respondents were asked to rank the different mediums the metro had provided them with.

The sample area for the project is Ernakulam district .The city is where KMRL operates and is the commercial capital of Kerala. Studying the impact that Metro's initiatives has on the youth population will help find out significant factors that influence their choice and how the metro can use this information to influence these choices and be successful in achieving their target of integration.

1.7 LIMITATIONS OF THE STUDY

- Validity and reliability of the data is dependent on the truthfulness of people and hence their responses.
- Due to limited time the project has only been able to consider a few selected aspects of the objectives.

  Eg: digitalization includes a lot more than ticketless travel and cashless transactions, but here those are the aspects we will focus on.
- The size of the sample is small in comparison to the population. This has occurred due to the limitation of resources.
- The study focuses on a very small subset of the entire user population of Kochi Metro.

1.8 CHAPTER SCHEME

The project entitled "IMPACT OF TRANSPORT INTEGRATION INITIATIVES OF KMRL ON YOUTH: A STUDY WITH REFERENCE TO ERNAKULAM" has been divided into the following chapters.

The first chapter of the project is an introduction to the system of KMRL. It includes the statement of problem, review of literature, objective, theoretical framework, methodology and limitations of the study.

In the second chapter, an attempt has been made to examine the various research topics. It contains an overview on the metro's contactless ticketing and payment systems, innovations regarding the same, pricing schemes used by the metro , the various last mile connectivity initiatives of the company and the latest addition which is water metro.It also has an overview on the consumers behaviour regarding the choices made with respect to these initiatives.

The third chapter titled "AN ANALYSIS OF THE IMPACT OF TRANSPORT INTEGRATION AND DIGITALIZING INITIATIVES OF KMRL ON YOUTH" contains the analysis and the observation of the data collected. In this chapter, we have used statistical tools such as tables, diagrams, percentage and ranks to analyse the data.

The last or the fourth chapter contains the findings and conclusions drawn from the data that was analyzed. It also contains suggestions based on the findings and observations.

The bibliography of references used for completion of the project and the annexure containing the questionnaire has also been enclosed towards the end of the project.

CHAPTER 2

AN OVERVIEW ON THE IMPACT OF TRANSPORT INTEGRATION INITIATIVES OF KMRL ON YOUTH

2.1. INTRODUCTION

KMRL is a centre-state public sector company. It was incorporated in 2011, in the state of Kerala. The company is equally owned by the state and central government . The metro rail system operated by KMRL underwent completion at an accelerated pace and was opened to the public in 2017.

As a city grows, the demand for better and innovative public transport services increase. Kochi being a major port and the commercial capital of the state of Kerala requires a sustainable, fast and affordable medium of transportation. The city has been on a continuous growth path since the 90s and new urban economic centres are mushrooming all over the city. Urban growth has greatly led to the growth of the IT sector and special economic zones in the city. Hence comes the needs to address the commuting requirements of the population.

KMRL has in hand a unique project that aims at integrating the entire public transportation system of the city i.e. metro rail, bus, autos and taxis to work as a single connected unit. This is expected to be achieved by bringing about a common ticketing and a centralized command and control [21]system for the network.

The 2nd chapter of this project will give the reader an understanding about KMRL, its current operations, its various other projects ,and initiatives the company has taken to integrate the entire transport system into a single system. The interest of this project is mainly on the concept of bringing about a common ticketing system and pricing strategies and the impact of such a system on the people. Along with that we will take a close look at the response of people at the first/last mile connecting initiatives of the metro. This will provide a clear overview on the extent to which people have absorbed the innovations and hence suggest measures that can be taken up by KMRL to achieve their mission of building a seemingly integrated system.

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21   Centre for Public Policy Research (CPPR). *Kochi Metro Ridership Improvement Survey*. 2019.

2.2. SERVICES OF KMRL

The construction of Kochi Metro has been taking place in a systematic manner. It was divided into 3 phases. Phase 1 included the construction of 25 stations from Aluva to Tripunithura. Phase 2 is a stretch of 11 stations from JLN Stadium to Infopark in Kakkanad. This phase has high revenue generating potential and also will earn the company a lot of new and regular service consumers. This is due to the economic importance of the Kakkanad area owing to the presence of Infopark. Phase 3 of KMRL will extend from Aluva to Angamaly. This stretch will thus link Aluva Station to Cochin International Airport Limited (CIAL). This phase is still being planned and is in line for approval. Once operational this extension of KMRL will attract a lot of regular and tourist consumers on a daily basis.. The advantages of this stretch will be a reduction of time taken to get to the airport as well as reduced traffic on road. There's also the added advantage of ease of travelling that is promoted via such a facility. This link will drastically improve the revenue of KMRL and also have a positive effect on the environment , due to the reduced number of personal vehicles on the roads.

KMRL's plan for Kochi also includes installation of Water Metro services. The metropolitan bound of Kochi includes a group of islands closely scattered in the Vembanad Lake. The islands are connected by road and ferry. They are popular tourist destinations in the city, hence making it necessary to have an efficient and easy transport system to get to all such islands, not just the most popular ones. Water Metro will become an environment friendly and energy efficient transportation system that will lead to development of 15 routes that will achieve a connection between 10 islands spread across 78 km . The project aims to set up 38 jetties and release a fleet of 78 electric hybrid ferries for integrating the islands of Kochi. This will help increase the social inclusion of the people on the remote islands and also help improve their livelihoods through promotion of the tourism sector.

KMRL has taken up the mission of integrated transportation for Cochin city by considering every angle of transportation in a city as well as the needs of people. Such a network can only be created when there's first and last mile connectivity available to the commuters. Needless to say that KMRL has been seeing to that these services are also progressively made available to people. Most of the metro stations are close to bus stops from where people can avail both private city buses or KSRTC buses for longer distances . Metro has also provided feeder bus

services. These electric feeder buses are as of now only available in aluva station, connecting people to the airport (CIAL), but is expected to provide increased number of services from Aluva to CIAL and also in other stations due to the increasing demand. Another step the Kochi Metro has taken towards providing people with an environment friendly connectivity measure is the Metro Auto. KMRL in association with Ernakulam Auto Rickshaw Drivers Cooperative Society has distributed smart autos as feeders in selected 6 stations. These Autos are truly pro - earth , not just due to the fact that they are electric but also due to the fact that they are extremely pocket friendly shared autos that promote carpooling. One of the most interesting connectivity services provided by KMRL would have to be the MYBYK Public bike sharing system. With this option people can borrow cycles from any metro stations in order to get to their desired location. The cycles are available at the docking stations underneath the Metro buildings and can be accessed through monthly subscription at extremely affordable rates through the MYBYK app. This initiatives not just promotes clean transportation, but also people's health and reduced traffic on roads.

2.3 INITIATIVES OF KMRL

From Water Metro to the public bike sharing system, KMRL has adopted several unique initiatives to suit the needs of the commuters in the city. Other than the connectivity measures, there are a few other digital initiatives Kochi Metro has introduced in order to make the transport system in the city truly work as an integrated unit.

2.3.1 KOCHI 1 CARD

KMRL makes use of an automatic fare collection system that relies on Radio Frequency Identification (RFID) / Quick Response (QR) tickets. This allows the passengers to buy tickets at the counters and enter and exit the gates after scanning them. Alongside this regular system , they have introduced KOCHI 1 Smart Card to make commuting easier for regular users of the metro services.

KOCHI 1 Smart Card is a prepaid mobility card that was launched by KMRL in association with AXIS Bank. The card allows passengers direct access to the metro, taking off completely , the need to fall in a queue to buy a ticket. This card allows the user to scan the card directly at the scanner in the gate and reduces the ticket charge based on the station of departure and arrival. In

addition to the convenience, the card offers the user 20% discount on the ticket price on every trip.

The prepaid card can be attained with a hard or soft copy of any of the commuter's identity proof (except for Aadhar card) and a mobile number. The card lasts a person for a period of 3 years and it can also be easily recharged through the counter at the metro station, through the KOCHI 1 App or through Axis Bank services.   The best feature of the prepaid card is the fact that it is multi utility in nature. It can be used not just to pay for metro tickets, but also for bus tickets, shopping, parking fees and dining purposes in any online/ retail store in Kochi.

The card takes out the need to carry multiple cards and promotes the concept of "Cashless Economy" and hence digitalization of the country.

2.3.2 KOCHI 1 APP

KMRL, in 2022 introduced the KOCHI 1 App , into their system. This app allows commuters to digitally book their tickets and helps the KOCHI 1 Card users to utilise their cards more efficiently. Hence the functions of this app are:

- Book tickets
- Check the ticket status
- Top up metro cards
- Plan the journey

The utility of this app lies in the fact that it has 2 sides, one that caters to the non card users and the other side that's designed for the card holders. The app allows users to not just book tickets online, but also cancel and get a refund on the ticket. The app also has options that allow UPI mode of Payment. The application is hence a one stop platform for accessing a vast majority of Kochi Metro services. The easy navigation and feedback option is what helps the developers bring in more users and upgrade the quality of the app as well.

2.3.3 PUBLIC BIKE SHARING SYSTEM

KMRL being an environment friendly service based company has not just realised the need for people to get to their exact locations but also has provided a pollution free solution for people to get to remote locations in the city. They have provided a public bike sharing system that allows users to rent cycles at extremely low prices from different metro stations in order to commute.

MYBYK is the public sharing system KMRL has made available in association with Mybyk. This system allows commuters to access cycles for rental with the help of the application. The

procedure for accessing the bikes only requires one to have an account in the MYBYK app and some money in the digital wallet. People can then access any cycle , from any hub of their choice as per their requirements .Commuters can rent these bikes on hourly, daily, weekly or monthly basis through the app. What makes the system attractive is that unlike the local bike rental system , where one has to drop the cycle exactly at the pick up location, under the MYBYK system , one can pick up and drop off the bikes at any hub based on convenience. Even the maintenance of the bikes are not the concern of the riders here, it's all handled by the company.

This system is not just environmentally friendly but is also an excellent first /last mile connectivity measure. There are remote or specific destinations that people want to get to , which can't be accessed without opting for comparatively expensive private modes of transport like autos or taxis after getting down from buses or Metro rail. This is where the bikes come into the spotlight. The system is an economical way for people to get to any location they want to in the city, as long as there is a Mybyk hub nearby. There are about 35 MYBYK Hubs in the city with 300+ cycles.

2.3.4 VERTICAL GARDENS

KMRL is a pro-earth company. They have taken numerous measures to make their services aesthetically pleasing and environment friendly. Pillars underneath the metro stations have been lined with hundreds of plants, grown and fertilized with the help of municipal waste. The gardens are regularly taken care of and well maintained by the workers.

2.3.5 RECYCLING PLASTIC BOTTLES

The city of Cochin faces a lot of crisis when it comes to waste management. KMRL has hence taken steps within its capacity to reduce this waste creation to certain extent. The company has installed plastic bottle recycling machines at a few metro stations. This allows people to dispose of their plastic bottles. The company then recovers it and makes these bottles suitable for recycling. These machines provide discount coupons to people as an incentive to recycle more.

2.3.6 RENEWABLE ENERGY AT KOCHI METRO

In the light of Kerala's heavy dependency on hydro electric energy for power requirements, KMRL has installed renewable sources of energy to power the Kochi Metro. Solar panels have been set up atop metro stations and at the Muttom depot to meet the power needs of the transit system. As of now, about 51% of the electricity requirements are solar generated. This is

expected to increase over the years, wherein the company will become completely solar powered like the CIAL model.

2.4 LAST MILE CONNECTIVITY MEASURES

Kochi Metro operated by KMRL stretches currently from Aluva to Thripunithura. Unlike bus stations which exist more frequently within a few metres, metro stations are little further apart from each other and also quite far from people's present locations. This affects the competency of metro services in comparison to the other existing options like buses and autos or even personal vehicles.

This is exactly why the Kochi Metro has come up with several first /last mile connectivity measures to make sure that the metro mode of travel becomes more comfortable and easily accessible to everyone.

Metro stations are common stops for buses which makes it easier for people to get a ride on the private city bus or KSRTC buses to their desired points. It's also equally easy to get auto rickshaws from the metro station switch is a popular mode of travel for the people in the city. For the personal vehicle users, there's parking facilities available in most of the stations .

Apart from these , there are a few exclusive initiatives of KMRL for improving the first/last mile connectivity of the passengers. They are:

1. Electric Feeder Buses
2. Electric Autos
3. Public Bike Sharing System (MYBYK)

Kochi Metro provides Electric Feeder Bus services from the Aluva metro station to CIAL as a step to connect the 2 important locations until the line extends till Angamaly as per Phase 3.

Though the plan was to have the feeder buses at a few selected stations , currently there are just 2 buses that operate from Aluva to CIAL and back. It's essential to know that the demand for more operations on this route is high due to the large number of people who depend on this service to get to CIAL quickly for travel as well as work (airport employees).

The second service is the electric autos and the shared Auto services. These are an economic and environment friendly alternative to the regular autos. The charges are lower for every additional Km and also there's the provision for allowing multiple passengers to travel at the same time, which allows the cost to be split , while contributing to a reduction in the traffic congestion on

the roads. There's not just promotion of car pooling among the citizens here, this shared electric autos are also a pro earth initiative by KMRL.

Only drawback of the system is that the system has not yet gained the desired amount of popularity due to its low number of available autos, which are moreover concentrated in the MG Road Metro station. These have led to many not even being aware of such a facility let alone use it.

One of the most appreciable steps taken by KMRL to improve its first and last mile connectivity is the installation of the non-motorized travel services at every station. Kochi Metro has introduced a Public bike sharing system called MYBYK and has put up docking stations in most of the metro stations where the bikes can be availed and dropped off after use. This allows commuters to rent bikes at a low subscription price and ride it to their desired locations and back to the stations .The system has lately been upgraded with the arrival of MYBYK App , which allows passengers to access information about availability of rental bikes through phone by registering and subscribing to the bike service. This medium of travelling was heavily promoted by KMRL through Cyclothon held in the city as its not just environment friendly but also a promotion of improving the health of the community in Cochin City.

2.5 USERS OF METRO

Kochi metro is a common source of transportation for students , working individuals , shoppers and tourists, as the Metro line manages to connect most of the significant parts of the city. The Metro system being a Rapid transit mode helps people cover shorter intra city distances much quicker than other modes of transport. It's also important for transport systems like Metro rail to flourish due to the contribution towards reducing environmental pollution and reduction of traffic congestion on the roads.

KMRL alongside CPPR had conducted a Ridership Improvement survey[22] and it was observed that the majority of metro users i.e. people who use metro services at least 3 times a week were utilising it to get to work. The next set of users mainly used the services to shop or for recreation purposes. It was also observed that student usage of the metro to get to educational institutions was low and they were still heavily dependent on the city bus services instead.

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[22] Centre for Public Policy Research (CPPR). *Kochi Metro Ridership Improvement Survey*, 2019.

The survey clearly shows that the majority of the current metro users were earlier bus travellers. The next main category was people who used personal vehicles to travel before shifting to metro rail for commuting. It's important to know that the shift in case of personal vehicle users is very low in comparison to those who were public transport users prior to the shift.

Among both regular and occasional metro users buses still remain a popular mode of transport for all purposes. After buses the priority is given to personal vehicles especially 2 wheelers.

The survey also inquires into the reasons as to why Metro is not a priority mode of transport for people . There were 2 main reasons cited by the respondents. One being the connectivity issue of metro rail. Second is the issue of a higher fare. Metro rail without any doubt connects some of the most important economic points of the city, but it also leaves out major centres like marine drive and high court junction from the map. Apart from this the first mile and last mile connectivity issue faced by people. Many people can't access metro services due to their residence being at least 1-2 km away from the metro corridor. Other issues involve the cost of shifting transports. The city bus service allows people to get to desired locations in a single ride. This makes it less desirable for people to shift their mode of transport more than once.

The second issue related to the metro being a secondary option of transport is the fare. The fare of Kochi metro is relatively higher than the other services when considering short distance travels. The fares also don't seem to be congruent with the income slabs of the majority of the commuters in the city. In addition to this the overall cost of using the metro which includes the first and last mile connectivity charges will be way more than 2 rides in a bus .This what makes it way less desirable than the other services that are available in the city.

2.6 RIDERSHIP AMONG YOUTH

Kochi Metro is vastly used by the people of Cochin city. The Ridership Improvement Survey[23] conducted by CPPR shows that about 70% of the riders of the Metro Rail were in the 31-40 years and the 21-30 years category.

This project has taken the 18-35 to be the defining age for the youth population who is in the centre of the project statement. Hence it wouldn't be wrong to say that the majority of metro users do fall under the age group we have considered.

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[23] Centre for Public Policy Research (CPPR). *Kochi Metro Ridership Improvement Survey*, 2019.

The survey shows that the majority of the people in the 21-30 category were regular metro users utilising at least 3-5 trips every week. These users included a considerable number of students and entry level professionals. On the other hand people in the 31-40 category made 6-10 trips in the Metro every week.

While considering people who use the metro , but on an occasional basis i.e less than 3 trips every week, the survey concludes that people who fell into 21-30 and 31-40 category amounted to less than 60%. It was concluded that about 90% of Metro users travelled for work related purposes . As far as the non metro users were concerned , the people in the 21-30 age category preferred 2 wheelers and those in the 31-40 category preferred 4 wheelers as a favoured mode of transport over the Metro services. But overall buses were most preferred by non metro users for work based commutation as well as educational purposes. Metro seems to be more preferred for recreational purposes and shopping among the occasional users.

2.7 ALTERNATIVE MODES OF TRANSPORTATION

Cochin city like any other city has numerous modes of transportation, out of which Metro Rail is one. The bus services, both city buses and KSRTC buses that cover longer distances are still the most critical modes of public transportation in the city. These services are provided by Kerala State Road Transport Corporation and (KSRTC) and Kerala State Urban Road Transport Corporation (KSRTC) jointly and by private operators.

After buses come the usage of personal vehicles. The share of these have been rising on the roads of the city. Auto Rickshaws have been a widely used mode of commutation for short distances for the past many years. Taxis do run throughout the city but their usage is not as high as compared to the above mentioned modes of transportation. Another mode of transport in Kochi is ferry service to get to the islands of Kochi.

Kochi Metro has been operating in the city since 2017 and has been expanding since then. Still the most preferred form of Public transportation for the people of the city are buses. This is due to 2 main reasons. One is the connectivity issue and the other is the charges. Metro connects some of the major economically significant areas of the city , but it's true that the corridor has missed out on many other important locations. This is where the bus services that cover the city wide and deep gain an advantage over the Metro. People face first mile and last mile connectivity issues when it comes to the metro, a problem that is extremely lower in case of the buses. They have to cover longer distances to get to a metro station and sometimes equally long

distances to get to their desired locations. Though Metro has come up with several first and last mile connectivity services, they are yet to spread to the extent as they were expected to. The next issue is that of the metro fare and the overall charges involved with using the metro. Though the metro's purpose is to help cover short distances quickly , the average metro fare is relatively higher than bus fares, which gives bus transport an upper hand as far as people's preference for regular usage is concerned. The overall cost involved in using the metro is also higher than other modes of transport for those people who have to cover a considerable amount of distance to get to the nearest metro stations and then from the metro stations to their final destinations. This makes the cost of using metro i.e. shifting multiple transport mediums a lot more expensive and non-feasible when they could have taken a possible single ride in the bus across the city to get to the same locations.

Despite these drawbacks as far as Metro Rail is concerned, KMRL's Water Metro has the potential to be groundbreaking by improving the connectivity to many remote islands of Cochin. The current ferry system in the city is inefficient and is disorganised. Water metro is to be launched with the best ferries in terms of technology, user attractiveness and environment friendliness. It will connect 10 islands spread across 78 km in the Vembanad lake, which will increase the potential of the tourism sector, improve the employment opportunities and livelihood of people in these islands and thus help in social inclusion of these island societies.

Clearly Metro Rail as such will be a lot more successful upon the completion of Phase 2 and 3. As noted before, there's high demand among commuters for additional feeder buses in the Aluva to CIAL route. This will be satisfied upon the completion of Aluva - Angamaly phase. Phase 3 of the metro will connect the existing line to Kakkanad Infopark. Data based on ridership in the metro clearly shows that most of the riders of the metro utilise the services to get to their workplace. It's a commonly known fact that a considerable number of professionals in the city are placed at infopark. This phase will open up a whole new revenue generating line for the company once completed.

CHAPTER 3

ANALYSIS OF THE IMPACT OF TRANSPORT INTEGRATION AND DIGITALIZING INITIATIVES OF KMRL ON YOUTH

3.1. INTRODUCTION

The project "IMPACT OF TRANSPORT INTEGRATION INITIATIVES OF KMRL ON YOUTH: A STUDY WITH REFERENCE TO ERNAKULAM" aims at studying the effect that the transport integrating and digitalising initiatives has upon people and their response to the same. The respondents for the study were selected based on convenience sampling. Since we have selected a broad category such as youth as our focus group, the first step done was to clearly define the "youth" population who we would consider in the study. Then the questionnaire was distributed to people who fall in the defined age group belonging to different sectors in the city of Ernakulam. With a total of 52 suitable respondents received , an attempt has been made to analyse their data to find out the impact the various transport integration and digitalization initiatives of KMRL has had on them.

Chapter 3 discusses the descriptive analysis of the study i.e the data collected from the study is discussed in descriptive form with the help of tables and figures, thus providing the necessary empirical support needed for the project. It highlights the inferences drawn out from each descriptive analysis to give a gist of the data collected for the study. First we cement our definition of the particular social group we have taken by analysing their age and nature of work. An attempt has been made to analyse the data to study the objectives of the project. The first objective is to find the extent of digitalization of metro rail transportation among youth in Ernakulam city. This is done by looking into the most utilised form of tickets for travelling via metro and also the preference for cashless payments while booking a ride in the same. The second objective is to find the popularity of different pricing strategies used by KMRL among youth. To find this we have analysed the awareness of people towards the different pricing schemes that Metro offers and also their response towards it i.e the extent to which they seek out such offers. The third and final objective is to study the benefit of additional transportation services offered by KMRL and the frequency of its usage among the defined population. This

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has been done by looking at the awareness of people about such additional services , their opinion concerning the number of units needed in each of these services and also the frequency of their usage of these services offered. Hence this chapter is a concoction of the people's response towards the transport integration initiatives of KMRL which includes additional transportation services and digitalisation initiatives.

3.2. BACKGROUND OF THE RESPONDENTS

The basic background of the respondents has been found out with the help of a simple questionnaire. Their data such as age, sex, occupation, and place and 3 most frequently visited Metro stations. This would help in providing a base for analysing the effect of Metro initiatives on the respondents from a psychological standpoint. The distinctiveness of the sample has been scrutinised by analysing these factors.

3.2.1. AGE DISTRIBUTION OF THE RESPONDENTS

The project that we have taken up has clear vision as to who we view as youth in our context. We have considered people aged between 18 to 35 as our sample. With the help of the questionnaire we have collected data from a total of 52 respondents and hence their ages. This data is what defines the "Youth" population that we have considered.

Table 3.1 shows the age distribution of the 52 respondents who participated in the study. 23.1% of the respondents were 22 years of age, 13.5% were 23 years old and 9.6% were 25 years old. 24 years and 26 years olds were 7.7% each, while 5.8% were 28 year olds. Ages 19, 20, 21, 29,30,31,32 occupied 3.8% each. Ages 18, 33 and 35 constituted 1.8% each out the total percentage. There weren't any respondents who were 27 or 34 years of age among the total number.

Figure 3.1 shows the age distribution of the Respondents in the form of a bar graph

Table 3.1 Age Distribution of the Respondents

Sr.No	AGE	No: of Respondents	Percentage (%)
1	18	1	1.9
2	19	2	3.8
3	20	2	3.8
4	21	2	3.8
5	22	12	23.1
6	23	7	13.5
7	24	4	7.7
8	25	5	9.6
9	26	4	7.7
10	27	0	0
11	28	3	5.8
12	29	2	3.8
13	30	2	3.8
14	31	2	3.8
15	32	2	3.8
16	33	1	1.9
17	34	0	0
18	35	1	1.9
	Total	52	100

Source: Primary Data

AGE DISTRIBUTION OF THE RESPONDENTS
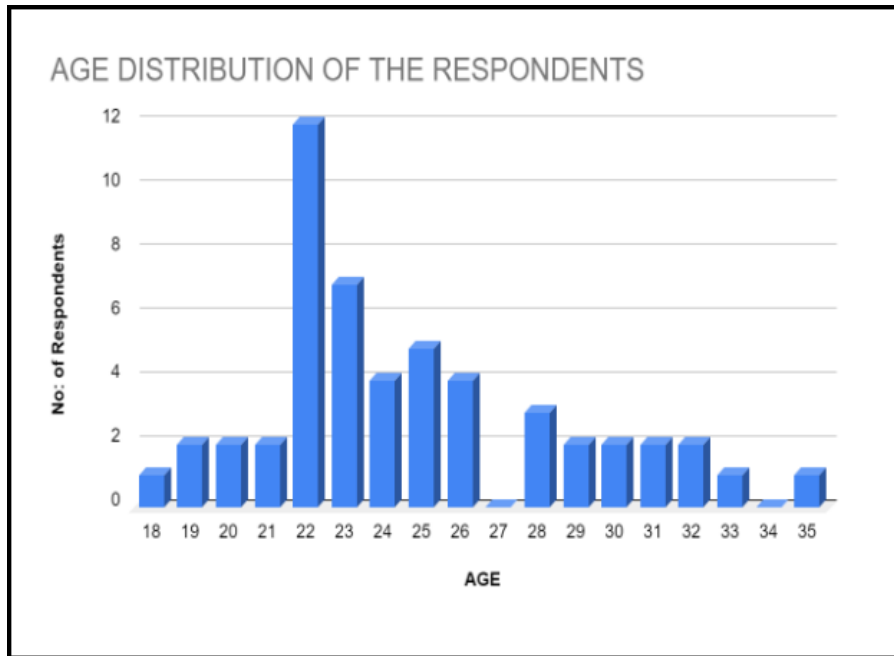
Figure 3.1   Source: Primary Data

3.2.2. GENDER DISTRIBUTION OF THE RESPONDENTS

It has been observed from the data collected that most of the Respondents were women. Table 3.2 clearly shows that 53.8% of the respondents were women. The rest 46.2 % were men. This means that 28 out of the total 52 respondents were women and only 24 were men.

Figure 3.2 shows the gender distribution of the respondents in form of a pie chart where blue shows the Female population and red shows the males.

Table 3.2 Gender Distribution of the Respondents

Sr. No	Gender	No: of Respondents	Percentage (%)
1	Male	24	46.2
2	Female	28	53.8
	Total	52	100

Source: Primary Data

GENDER DISTRIBUTION OF THE RESPONDENTS

28 (53.8%)   24 (46.2%)

● Male   ● Female
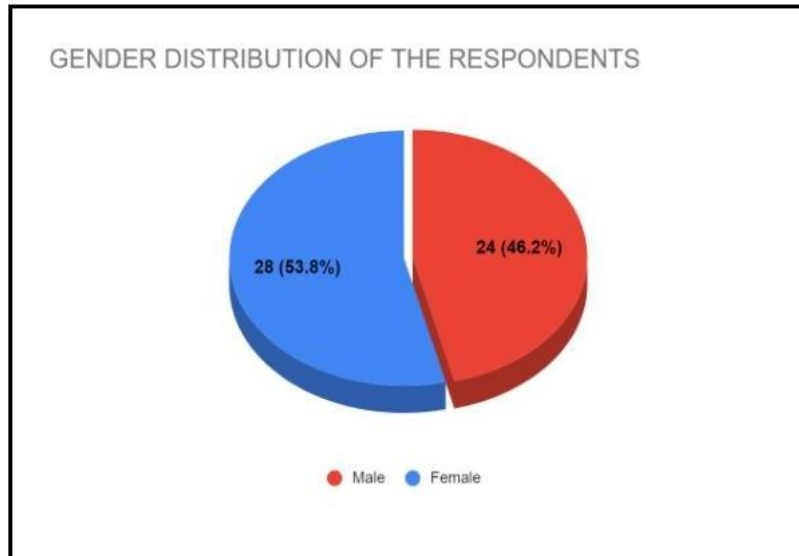
Figure 3.2   Source: Primary Data

3.2.3. OCCUPATION OF THE RESPONDENTS

Occupation of the respondents has been collected via the questionnaire to understand what portion of this category "Youth" that makes use of the Metro services belong to Student, working or non-working population. This would help us understand the popularity of the Metro among the different groups and hence their preferences towards various Metro's additional services.

Table 3.3 shows the occupation of the Respondents. The largest category would be students comprising of 28 of the 52 respondents therefore occupying 53.8%. this has been followed by 34.6% i.e. 18 respondents in the Working category. The least number of respondents were in the non-working or Homemaker category, which came upto just 6 respondents or 11.5% of the total.

Figure 3.3 represents the distribution of Occupation of the respondents in form of a pie chart.

Table 3.3 Occupation of the Respondents

Sr. No	Occupation	No: of Respondents	Percentage (%)
1	Student	28	53.8
2	Working	18	34.6
3	Homemaker	6	11.5
	Total	52	100

Source: Primary Data
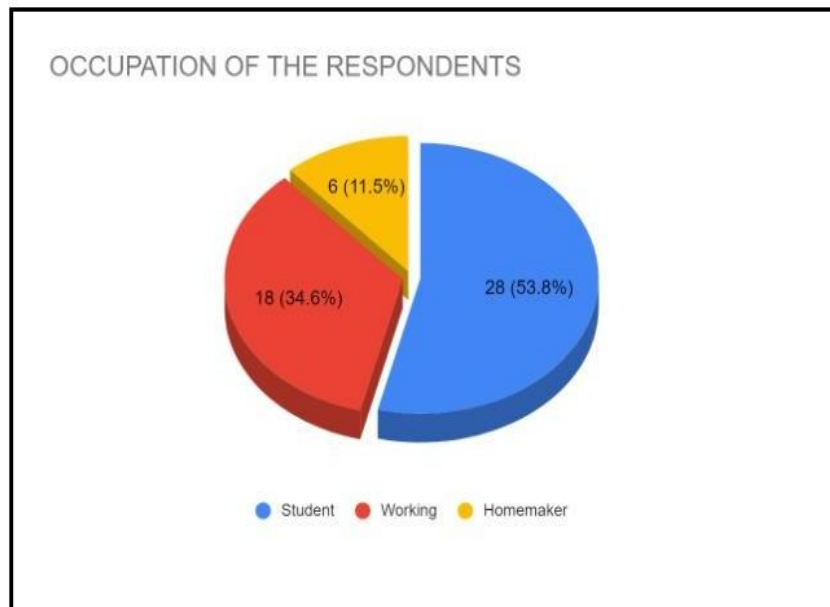
Figure 3.3   Source: Primary Data

3.2.4. PLACE OF RESIDENCE OF THE RESPONDENTS

This study has been conducted with a clear reference to the city of Ernakulam. Finding out the place of residence of the respondents helps give more distinctiveness w.r.t to the coverage of metro services into the people who belong to different parts of the city which will be significant for analysing people's preference for the metro and its Last mile connectivity services over the other options available in the city.

Table 3.4 shows the respective places of residence of the 52 respondents. Highest numbers i.e. 11 of respondents were from Edappally which is an important commercial junction in the city. Figure 3.4 shows the place of residence of the respondents in form of a bar graph.

Table 3.4 Place of Residence of the Respondents

Sr.No	Place	No: of Respondents
1	Aluva	5
2	Edappally	11
3	Elamakkara	2
4	Vattakkunnu	1
5	Kalamassery	6
6	Fort Kochi	2
7	Ponekkara	2
8	MG Road	1
9	Kakkanad	1
10	Kaloor	6
11	Palarivattom	3
12	Thevara	3
13	Chottanikkara	1
14	Ambattukavu	1
15	Vytilla	2
16	Ammankovil Road	1

17	Thrikkakara	1
18	Chellanam	1
19	Companypadi	1
20	Kadavanthara	1
	Total	52

<div align="right">Source: Primary Data</div>

PLACE OF RESIDENCE OF THE RESPONDENTS
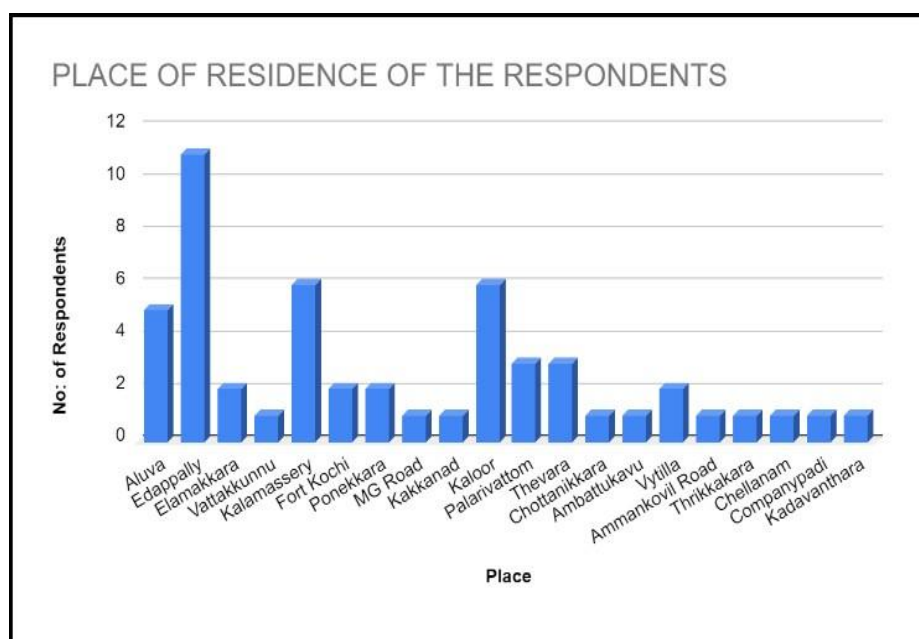
Figure 3.4   Source: Primary Data

3.2.5. STATIONS FREQUENTLY VISITED BY THE RESPONDENTS

The questionnaire has also been used to find out the stations that have been most frequently visited by the respondents. Each respondent was given 3 choices from the total no: of stations that are currently operating under the Metro system. This helps us understand the most popular stations among the people, which can also be used to justify the purpose of travel which has been later collected in the project. Every metro station located at different parts of the city has some important commercial, academic or medical centres surrounding it. This data concerning most

popular stations when clubbed with purpose of travel of people can be a tool to generalize the purpose of usage of Metro among the people of the city.

Table 3.5 shows the stations most frequented by the respondents of the study. The most popular 3 stations in acending order would be Edappally followed by Aluva and Maharaja's College. Thykoodam, Petta and Vadakkekotta turned out to be the least popular with zero respondents choosing it. The table shows a total of 156 responses. This is due to the fact that each respondent was given 3 choices from the array of stations.

Figure 3.5 is a bar graph representation of the stations most frequented by the respondents.

Table 3.5 Stations frequently visited by the Respondents

Sr. No	Stations	No: of Respondents	Percentage (%)
1	Aluva	21	13.5
2	Pulinchodu	1	0.6
3	Companypadi	3	1.9
4	Ambattukavu	1	0.6
5	Muttom	0	0
6	Kalamassery	9	5.8
7	CUSAT	3	1.9
8	Pathadipalam	3	1.9
9	Edappally	37	23.7
10	Changampuzha Park	6	3.8
11	Palarivattom	5	3.2
12	JLN Stadium	4	2.6
13	Kaloor	12	7.7

14	Town Hall	3	1.9
15	MG Road	8	5.1
16	Maharaja's College	20	12.8
17	Ernakulam South	3	1.9
18	Kadavanthara	3	1.9
19	Elamkulam	2	1.3
20	Vytilla	8	5.1
21	Thykoodam	0	0
22	Petta	0	0
23	Vadakkekotta	0	0
24	SN Junction	4	2.6
	Total	156 (52*3)	100

Source: Primary Data
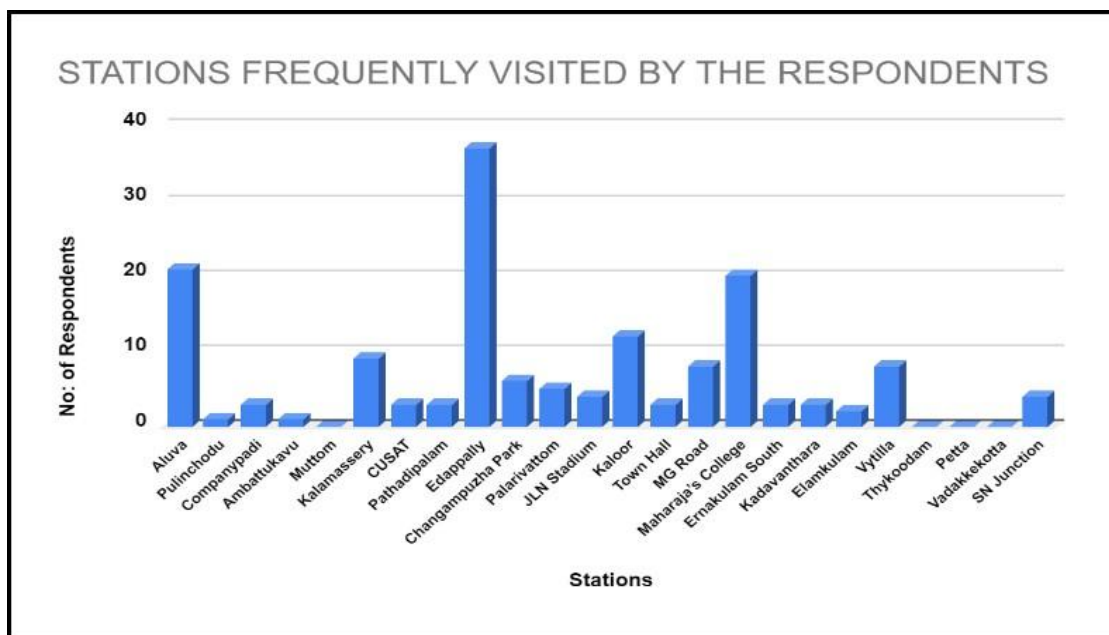
Figure 3.5   Source: Primary Data

3.2.6. PURPOSE OF TRAVEL

Knowing people's motif to use the metro is important especially since there are other alternative transport services that overtake Metro when it comes to consumer preferences. This data when clubbed with the most frequently visited stations will add up to give a comprehensive idea as to the purposes the general population opt to use the metro for.

Table 3.6 shows the purpose of travel of the respondents to this study, using the metro. The respondents were allowed to choose more than 1 option from the give, which explains why the total number of responses exceeds the original 52. It can be seen that 38.8% of the respondents used metro to go shopping. The next most popular purpose of using the metro is to get to academies and educational institutions. This is followed by 17.6% of the respondents using it to get to work, 10.6% for medical purposes and a final 3.5% using it for other purposes like getting to sports centres, government offices and traveling to transport hubs

Figure 3.6 shows the purpose of travel of the respondents in form of a pie chart.

Table 3.6 Purposes of travel of the Respondents

Sr.No	Purpose of Travel	No: of Respondents (52)	Percentage (%)
1	Work	15	17.6
2	Educational Institutions /Academies	25	29.4
3	Shopping	33	38.8
4	Medical Purposes	9	10.6
5	Others (1. Sports 2. Government Offices 3. Going to Hometown)	3	3.5
	Total responses	85	100

Source: Primary Data

NOTE: Some of the respondents have selected more than one option so the no: of responses have outnumbered the respondents.

PURPOSE OF TRAVEL OF THE RESPONDENTS

15 (17.6%)

25 (29.4%)

33 (38.8%)

● Work ● Educational Institutions ● Shopping ● Medical Purposes
● Others
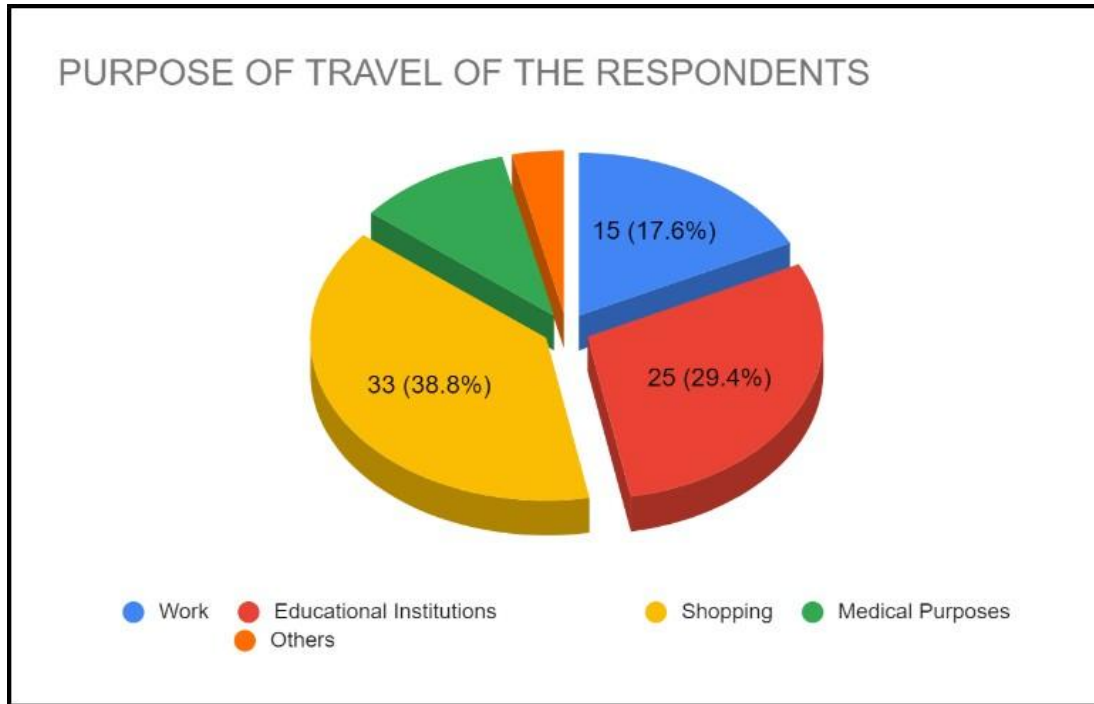
Figure 3.6   Source: Primary Data

3.3. FREQUENCY OF METRO USAGE AMONG RESPONDENTS

Frequency of usage of the Metro among the respondents is a basic factor we require to understand their preferences regarding all the other aspects of Metro services. This is because the preference of someone who uses metro regularly would vary vastly when compared to someone who uses it occasionally or rarely when it comes to types of tickets preferred or mode of payments they use, which are the aspects that we wish to observe in this study to find out the extent to which the digitalising initiatives of metro has spread to people and also impact of their attractive pricing schemes on people.

Table 3.7 shows that 34.6% of the respondents use Metro on an occasional basis. 26.9 % use it on a daily basis. People who use it a few times a week and a few times a year constitute 19.2% each and there wasn't anyone of the respondents who completely avoided using Metro as a form of transportation..

Figure 3.7 shows the frequency of usage of Metro by the respondents in form of a Pie chart.

Table 3.7 Frequency of Metro usage by the Respondents

Sr.No	Frequency of using the Metro	No: of Respondents	Percentage (%)
1	Always (Daily basis)	14	26.9
2	Often (Few times a week)	10	19.2
3	Occasionally (Few times a month)	18	34.6
4	Rarely (Few times a year)	10	19.2
5	Never	0	0
	Total	52	100

Source: Primary Data
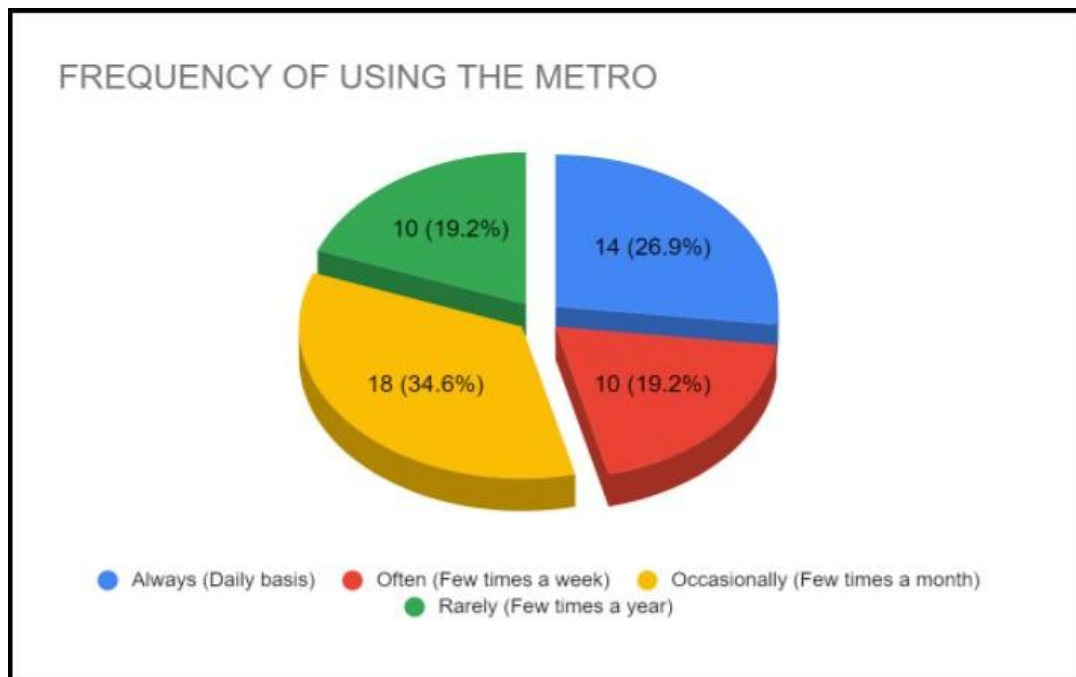
Figure 3.7   Source: Primary Data

3.4. SCOPE OF DIGITALISATION OF KOCHI METRO

To find out the extent to which Metro is Digitalized among the Youth population we have to look at their preference for different types of ticketing options offered by the Metro as well as their preferred mode of payment. While metro does have the option of paper tickets, they have a range of different digital or paperless ticket options which they have been trying to promote with attractive pricing schemes. This along with the frequency of usage of cashless payment modes by the respondents will give us the impact of digitalisation initiatives of the metro and also the extent to which people have adopted it.

3.4.1. PREFERENCE FOR DIFFERENT TYPES OF TICKETS

Kochi Metro offers people 4 options regarding their tickets. They can go for an ordinary over the counter paper ticket, an E-QR ticket, Kochi 1 card or go for an unlimited travel pass (Regular and student).

Table 3.8 shows the respondents preference regarding the ticketing options. They were asked to rank the 4 different types of tickets with Rank 1 being given to their 1st choice and 4 to their last. The data collected was then given weights and the total weighted points were calculated for each of the types.

Formula used: Total weighted points = (Rank 1 *4) + (Rank 2*3) + (Rank 3*2) + (Rank 4*1)

The method that has been used for estimating the final preference of the population is the Weighted Ranking method. Based on the total weighted points for each option , Final ranks were give, where Rank 1 would go to the most preferred ticket type and 4 to the least preferred.

Table 3.8 Respondent's Preferences for Different types of Tickets

Sr.No	Preference for different types of tickets	No: of Respondents who gave Rank 1	No: of Respondents who gave Rank 2	No: of Respondents who gave Rank 3	No: of Respondents who gave Rank 4	Total Weighted points	Final Rank
1	Paper QR Tickets	23	8	8	13	145	1

2	E- QR Tickets	7	26	11	8	136	3
3	Kochi 1 Card	19	7	21	5	144	2
4	Limitless Travel Passes	3	11	12	26	95	4
5	Total	52	52	52	52	520	

From the table 3.8 we can see that Paper QR Tickets ranked 1st and turned out to be the most preferred type of ticket. This is followed by the preference for Kochi 1 Card in the 2nd place and E-QR tickets in the 3rd place. The least preferred turns out to be the Limitless Travel passes which ranked at the 4th position.

Figure 3.8 shows the ticket preference of the respondents in form of a pie chart.
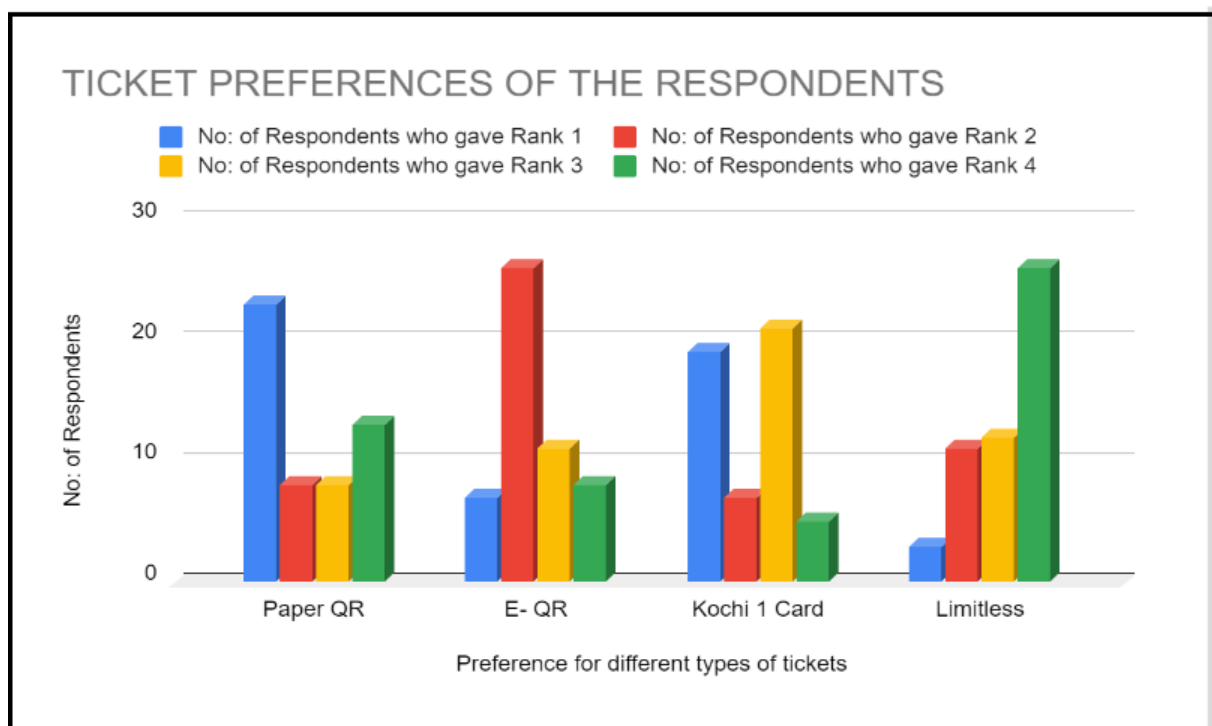
Figure 3.8   Source: Primary Data

3.4.2. PREFERENCE FOR THE DIFFERENT MODES OF PAYMENT

Cashless economy has been an ambitious goal of the Government of India under its comprehensive digitalisation initiative of "Digital India". The scope or extent to which metro has been able to digitalise its services will also depend the mode of payment commuters prefer the most.

Table 3.9 has been constructed by utilising the Weighted Ranking method. Respondents were asked to rank the 4 different Modes of payment with Rank 1 being given to their 1st choice and 4 to their last. The data collected was then given weights and the total weighted points were calculated for each of the types.

Formula used: Total weighted points = (Rank 1 *4) + (Rank 2*3) + (Rank 3*2) + (Rank 4*1)

Based on the total weighted points for each option, Final ranks were give, where Rank 1 would go to the most preferred ticket type and 4 to the least preferred.

Table 3.9 Respondent's Preferences for Different Modes of Payment for Tickets

Sr.No	Preference for different modes of Payments	No: of Respondents who gave Rank 1	No: of Respondents who gave Rank 2	No: of Respondents who gave Rank 3	No: of Respondents who gave Rank 4	Total Weighted points	Final Rank
1	Cash	25	8	7	12	150	1
2	Cards (Credit or Debit)	6	29	11	6	139	2
3	Kochi 1 Smart Cards	16	4	20	12	128	3

4	Kochi 1 App (Online Payment)	5	11	14	22	103	4
5	Total	52	52	52	52	520	

From the table 3.9 we can see the respondent's preference for the different modes of payment for the tickets. Clearly Cash has ranked 1st and hence is the most preferred out of all the other forms, this is followed by Credit/Debit Cards in the 2nd place. Kochi 1smart card or Metro card ranked 3rd and the 4th rank went to online payment via Kochi 1 app.

Figure 3.9 shows the same payment preference of the respondents in graphical form.
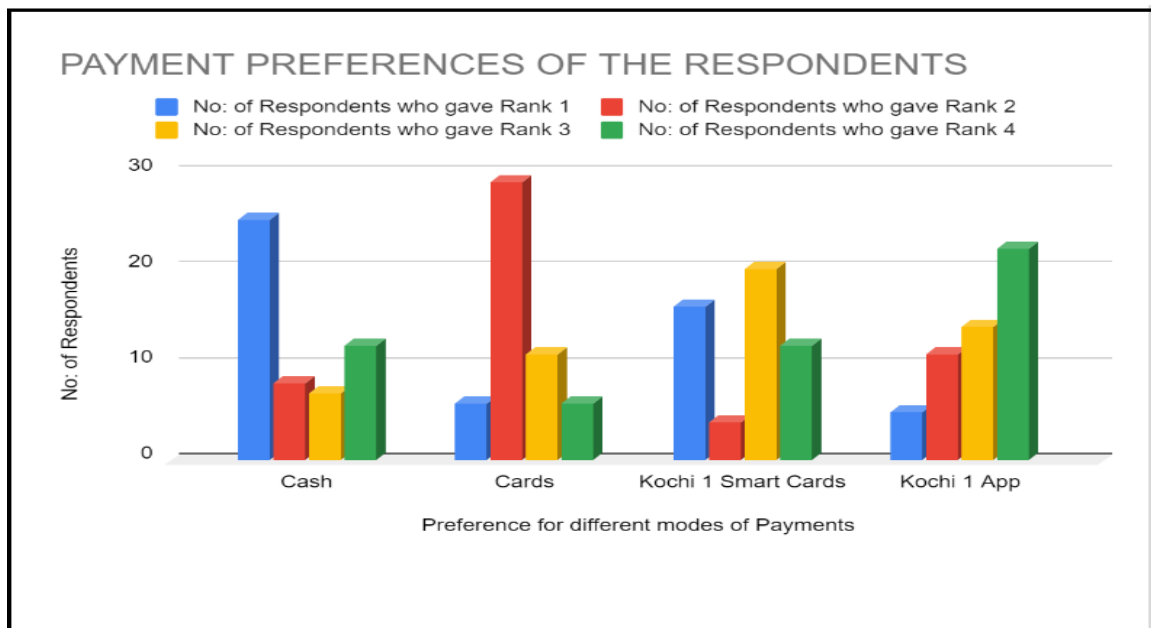
Figure 3.9   Source: Primary Data

3.5. AWARENESS AND POPULARITY OF DIFFERENT PRICING STRATEGIES AMONG THE RESPONDENTS

Kochi Metro has been putting out a lot of pricing schemes associated with different types of ticketing options in order to attract more passengers as well as increase the digitalized form of transportation. The ultimate moto of the company is to integrate the entire transportation system in the city and they hope to achieve this by setting up a common ticketing and command and control system for all the operations in this network. To attract more people into adopting digitalized form of ticketing rather than the ordinary paper tickets Kochi Metro has a lot of pricing strategies. Discounting and peak load pricing being the most noticeable ones. Through this project we intend to look at the scope of these strategies and understand the impact this has had on the people. This will help us view the 1st objective of studying the extent of digitalization with added perspective.

3.5.1. PREFERENCE FOR DISCOUNTLESS PAPER TICKETS OVER OTHER OPTIONS

The most commonly used tickets is the over the counter paper ticket as was shown with table 3.8. With the help of the questionnaire we have tried to confirm respondent's preference for the paper tickets against the other available options.

Table 3.10 shows that 59.6% of the commuters prefer to make use of the regular paper tickets that have no discounts for most of their travels. 40.4% of the commuters don't prefer the discount less paper tickets as their primary choice.

Table 3.10 Respondents Preference for Paper Tickets

Sr.No	Commuters prefer to make use of the regular paper tickets that have no discounts for most of their travels	No: of Respondents	Percentage (%)
1	Agree	31	59.6
2	Disagree	21	40.4
3	Total	52	100

Source: Primary Data

Figure 3.10 shows the preference of commuters for the discount less paper tickets in the form of a pie chart.

RESPONDENT'S PREFERENCE FOR THE DISCOUNT LESS PAPER TICKETS

21 (40.4%)   31 (59.6%)

● Agree   ● Disagree
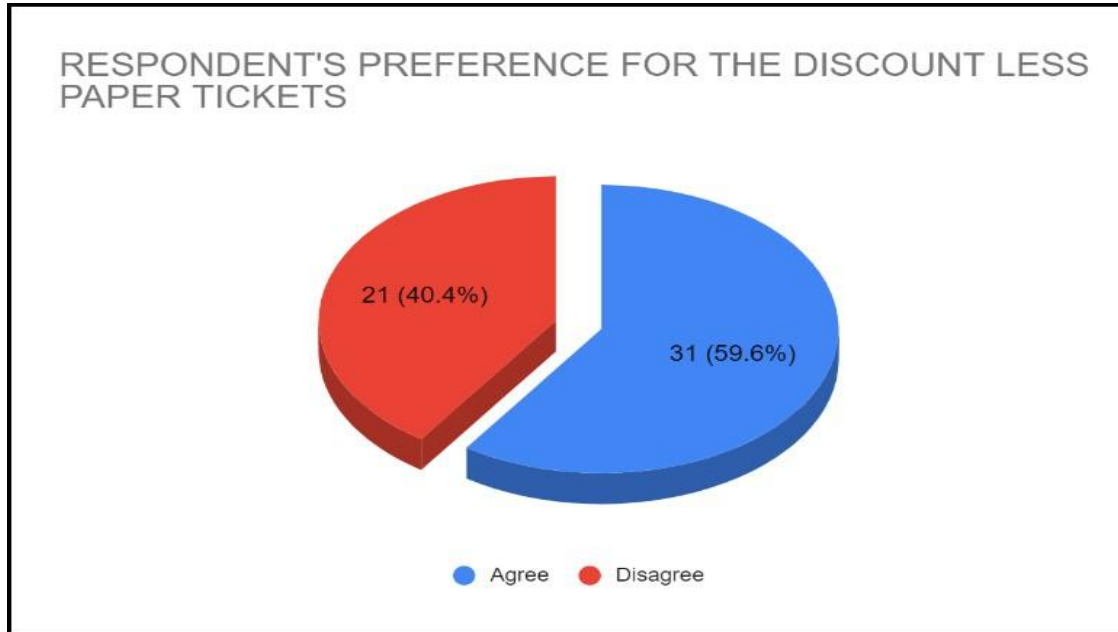
Figure 3.10   Source: Primary Data

3.5.2. PASSENGER PREFERENCE TO TRAVEL IN METRO DURING NON PEAK HOURS

To analyze the success of KMRL's pricing strategies in attracting consumers it's important to look at the commuters choice to travel in the Metro during non peak hours i.e. from 5:45 am - 8:00am and 9:00 pm – 11:00pm. This is due to the fact that Metro offers the highest discount i.e. of 50% during the non peak hours on tickets. But here currently we are simply looking at the personal preference to travel during the non peak hours, keeping aside the discount factor.

Table 3.11 shows the preference of the commuters to travel during the non peak hours. It can be seen that 63.5% of the respondents don't particularly opt for travelling in the non peak hours, while 36.5% do.

Table 3.11 Respondents Preference for travelling during Non Peak Hours

Sr.No	Commuters prefer to frequent the Metro during non peak hours	No: of Respondents	Percentage (%)
1	Agree	19	36.5

2	Disagree	33	63.5
3	Total	52	100

Figure 3.11 shows the preference of the commuters to frequent the metro during the non peak hours in form of a pie chart
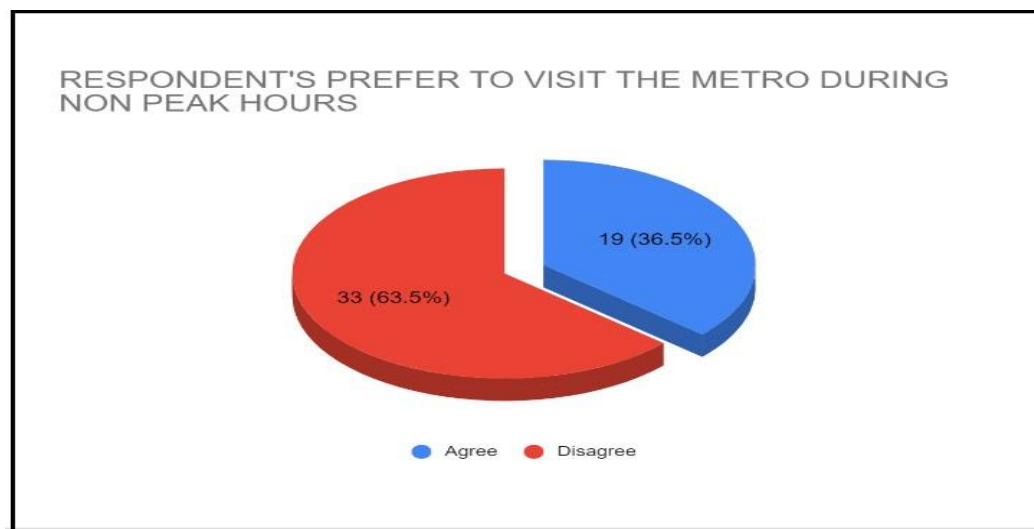
Figure 3.11   Source: Primary Data

3.5.3. PASSENGER PREFERENCE TO TRAVEL IN METRO DURING NON PEAK HOURS TO AVAIL THE DISCOUNTS

While the figures earlier was simply to find out the preference to travel during the non peak hours , in this segment we expand the question to include the availability of discounts as an incentive to travel during the non peak hours and how that factor affects the decision.

Table 3.12 shows that 17.3% of the respondents strongly agree that they prefer to travel in the metro during the non peak hours to avail the discount. 25% simply agree that they do opt travelling in the non peak hours to make use of the discounted prices. 28.8% of the respondents were neutral about it, while 19.2% of the respondents disagreed to prefer traveling during this time. Finally 9.6% of the respondents strongly disagreed that they would opt to travel during the non peak hours to avail the flat discount on the prices.

Table 3.12 Respondents Preference for travelling during Non Peak Hours to avail the Discount

Sr.No	Commuters prefer to travel in Metro during non peak hours to avail the flat 50% discount on original prices.	No: of Respondents	Percentage (%)
1	Strongly Agree	9	17.3
2	Agree	13	25
3	Neutral	15	28.8
4	Disagree	10	19.2
5	Strongly Disagree	5	9.6
	Total	52	100

Source: Primary Data

Figure 3.12 shows the preference of the respondent commuters to travel during the non peak hours due to the incentive of the 50% discounts available on the fare in form of a pie chart.

RESPONDENT'S PREFERENCE TO TRAVEL VIA METRO IN NON PEAK HOURS TO AVAIL 50% DISCOUNT

9 (17.3%)
13 (25.0%)
15 (28.8%)
10 (19.2%)

● Strongly Agree ● Agree ● Neutral ● Disagree ● Strongly Disagree
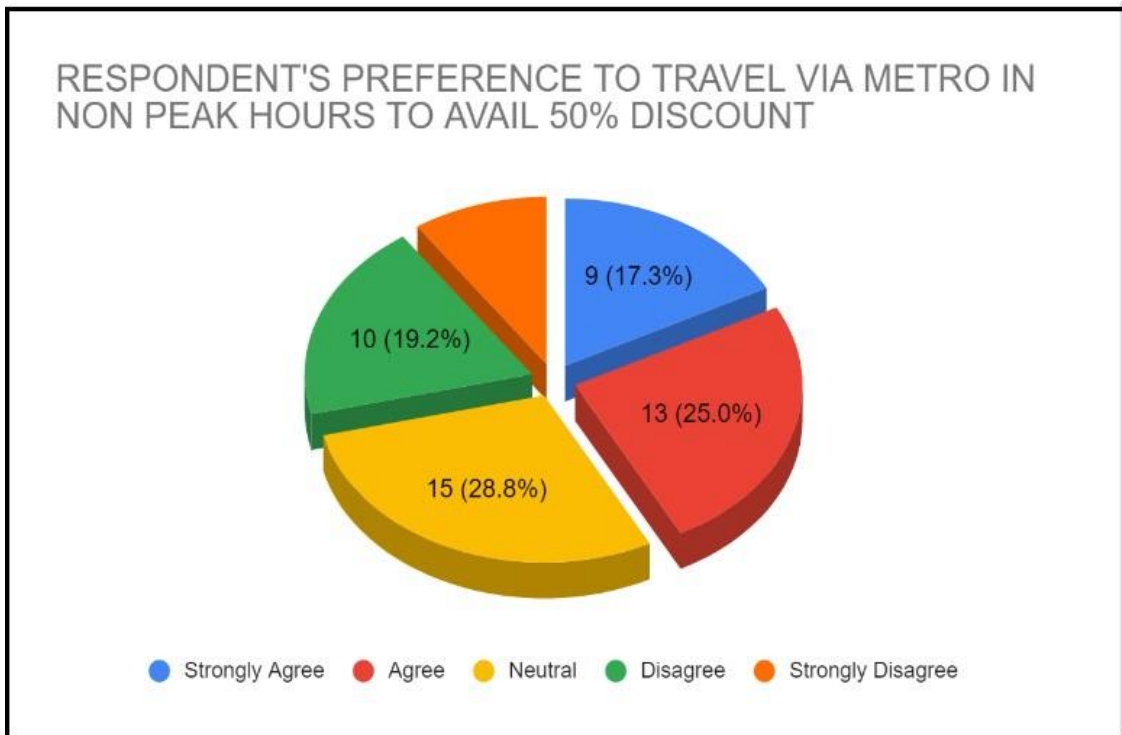
Figure 3.12   Source: Primary Data

3.5.4. RESPONDENT'S AWARENESS ON THE DIFFERENT DISCOUNTS ON METRO FARES

Table 3.13 shows the awareness of the respondents concerning the different types of discounts that Metro offers on its various types of tickets. Only 37 of the 52 respondents were aware of the flat 50% off during the non peak hours. 31 were aware of the 10% discount on the E-QR tickets. 39 respondents knew about the 20% off on Kochi 1 card, while only 24 were aware of the discounts on the trip passes.

Table 3.13 Respondents Awareness on the Different Discounts on the Fares

Sr.No	Different types of discounts available in Metro	Respondents who were aware of the discounts	Respondents who were not aware of the discounts	Total
1	Flat 50% off during non peak hours	37	15	52
2	10% off on e-tickets	31	21	52
3	20% off on Kochi 1 Cards	39	13	52
4	Upto 60% off on trip passes	24	28	52

Source: Primary Data

Figure 3.13 shows the no: of respondents who were aware and unaware about the respective discounts on the respective options in form of a bar graph.
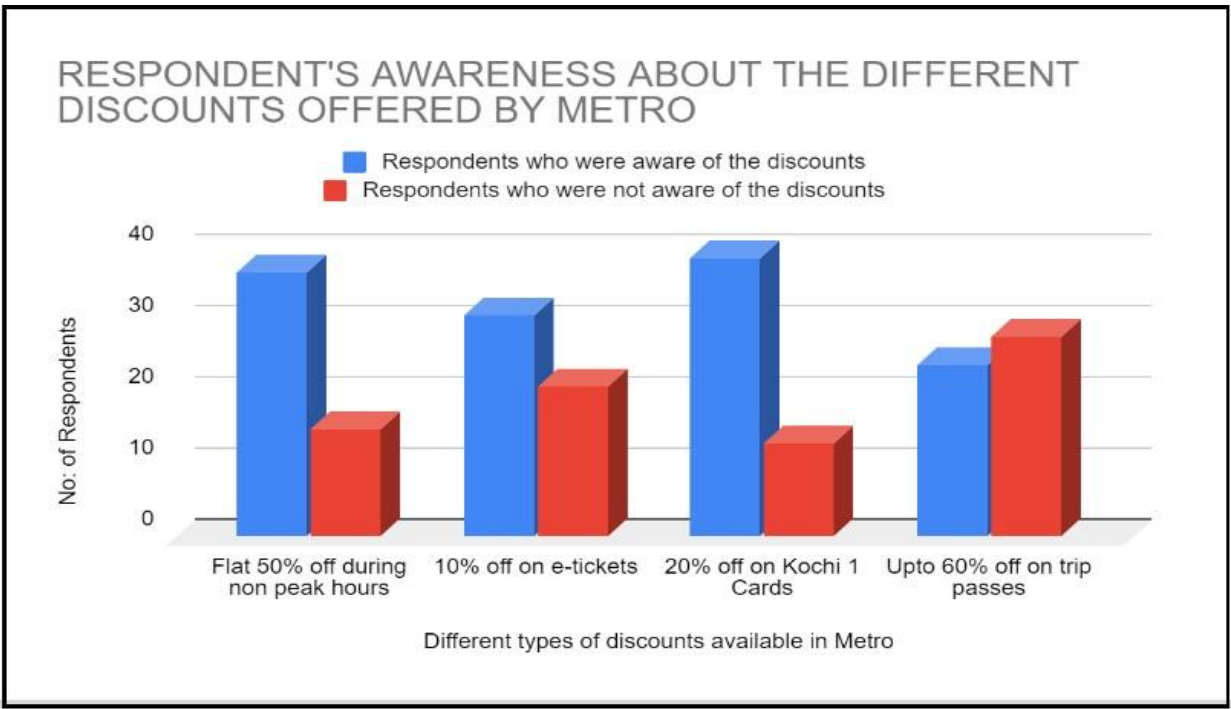
Figure 3.13   Source: Primary Data

3.5.5. RESPONDENT'S PREFERENCE TOWARDS VARIOUS DISCOUNT OFFERING TICKET OPTIONS

While being aware of the possible offers that the Metro provides is one thing, willingness to utilise it is another. Table 3.14 shows the no: of respondents who prefer and not prefer to use the discount offering ticket buying options. It can be seen that 25 respondents each were preferring to use the discounts available during the non peak hours, through Kochi 1 App and Kochi 1 Card respectively , while 27 each prefer not to use it or are indifferent. 14 of the 52 respondents prefer to use the Trip passes to get the discounted fares, but 38 respondents prefer not to or are indifferent.

Table 3.14 Respondents Preference towards various Discount offering ticket options

Sr.No	Discount offering ticket buying options available	Respondents prefer to use it	Indifferent	Total
1	Travel during non peak hours	25	27	52

2	Kochi 1 App	25	27	52
3	Kochi 1 Card	25	27	52
4	Trip Passes	14	38	52
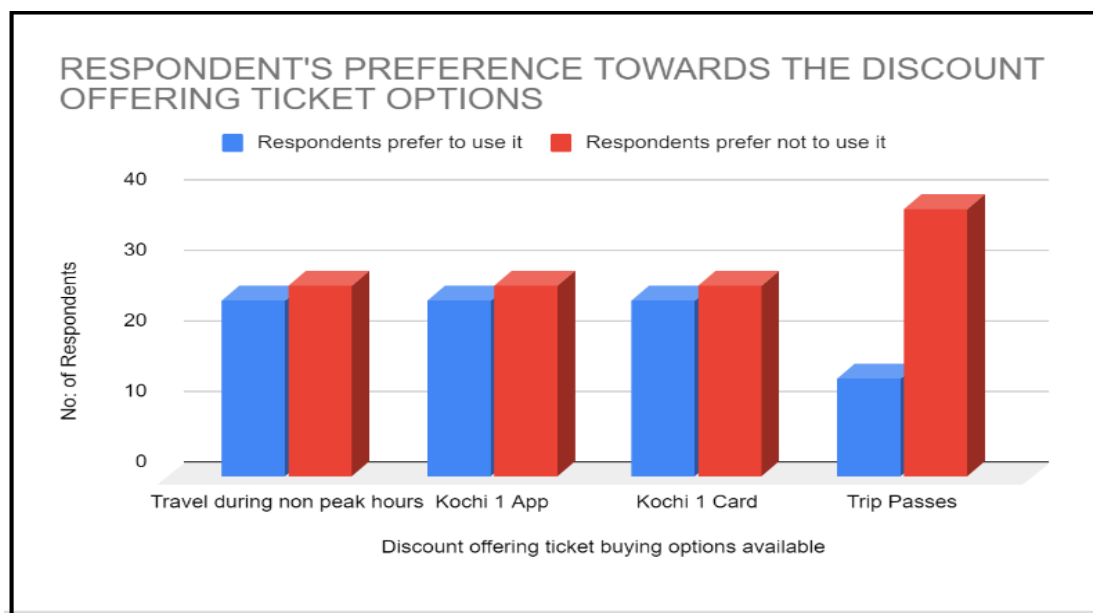
Figure 3.14   Source: Primary Data

3.6. RESPONSE OF STUDENT RESPONDENT'S TOWARDS VARIOUS TRAVEL SCHEMES OF KOCHI METRO

From the earlier sections of our analysis we were able to find out that 28 of 52 respondents were students, making them the largest group in the sample. Therefore, it's important to understand how the pricing strategies that is meant to take metro closer to the ultimate goal of integrated transportation has affected them and also to what extent the initiatives that lead to it have influenced them. This becomes especially important as Metro has been trying to attract a whole lot of students through special schemes for them.

3.6.1. FREQUENCY OF USAGE OF UNLIMITED PASSES FOR STUDENTS

Unlimited passes for students are cheaper than the regular travel passes. Table 3.15 shows the preference of student respondents to use the unlimited trip passes for their travel. It can be seen that 50% of the student respondents prefer to use the unlimited student passes , whereas the other 50% don't necessarily prefer it.

Table 3.15 Student Respondents Frequency of usage of unlimited student passes

Sr.No	Student commuters prefer to use Unlimited Trip passes for students	No: of Respondents	Percentage (%)
1	Agree	14	50
2	Disagree	14	50
	Total	28	100

Source: Primary Data

Figure 3.15 shows the usage preference of the student respondents regarding the unlimited student passes in form of a pie chart.
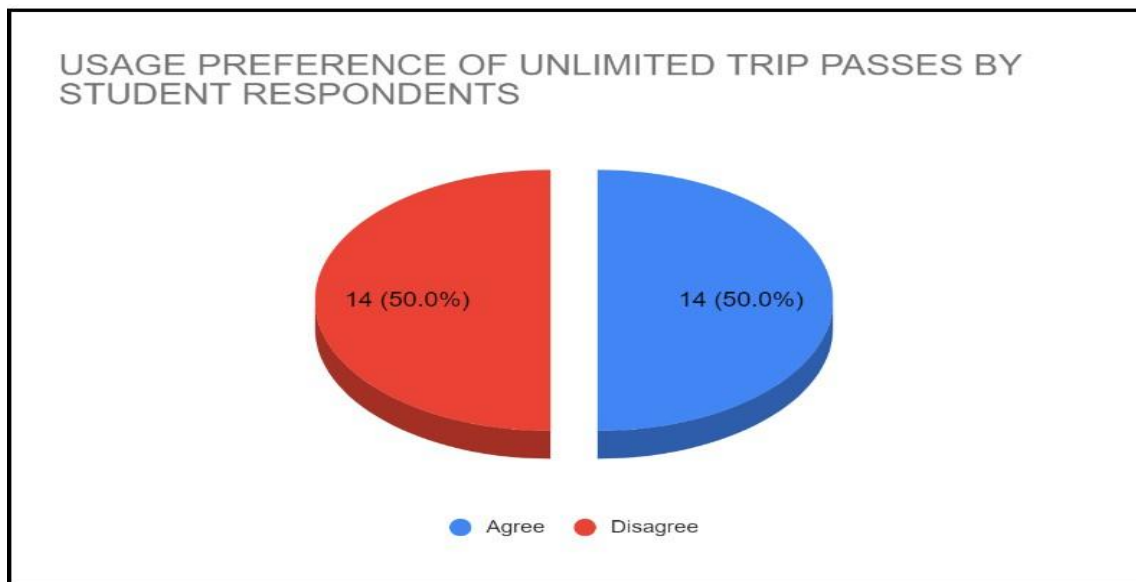
Figure 3.15   Source: Primary Data

3.6.2. STUDENT OPINION ON THE AFFORDABILITY OF THE UNLIMITED TRAVEL PASSES

Drawing the attention of student commuters would require a service to be both efficient as well as affordable. Kochi Metro has come up with unlimited Passes for students which are cheaper than the regular passes, but the student's opinion on its affordability is also important.

Table 3.16 shows the opinion of the student respondents on the affordability of the unlimited travel passes for students. 60.7% of the respondents though it was affordable. 32.1% consider its prices to be neutral, whereas 7.1% of the student respondents consider it to be unaffordable. None of the respondents described the passes to be either "extremely affordable" or "extremely unaffordable".

Table 3.16 Student Respondents Opinion on affordability of the Unlimited Travel Passes

Sr.No	Student Commuter's opinion on the affordability of the unlimited travel passes (for students)	No: of Respondents	Percentage (%)
1	Extremely Affordable	0	0
2	Affordable	17	60.7
3	Neutral	9	32.1
4	Unaffordable	2	7.1
5	Extremely Unaffordable	0	0
	Total	28	100

Source: Primary Data

Figure 3.16 shows the opinion of the student respondents regarding the affordability of the unlimited trip passes in the form of a pie chart.

STUDENT RESPONDENT'S OPINION ON AFFORDABILITY OF UNLIMITED TRIP PASSES

Affordable — 17 (60.7%)
Neutral — 9 (32.1%)
Unaffordable
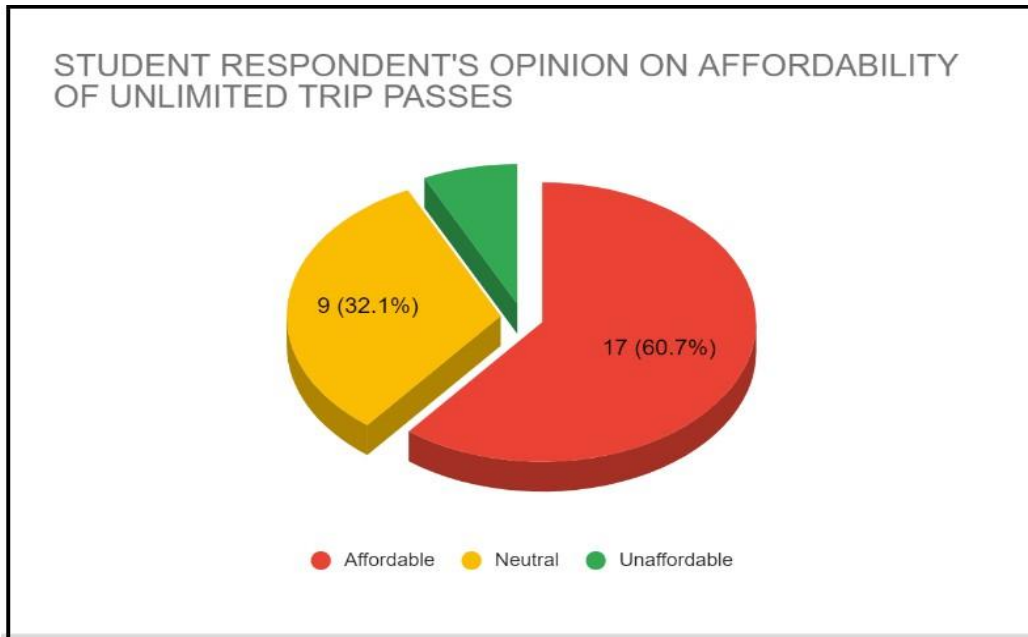
Figure 3.16   Source: Primary Data

3.6.3. STUDENT PREFERENCES FOR THE DIFFERENT TYPES OF TICKET OPTION

In the earlier sections we did see the preference of the respondents for the different type of ticket options. The reason for separately looking at the preference regarding tickets of the student is due to the possible fact that when we consider "youth" i.e. in this context people between 18-35 years of age we might be looking at a good portion of students in the group and this has been proven by the fact that 28 of our 52 respondents were students.

Table 3.17 shows the preference of student commuters with respect to the types of tickets available. Here again we have made use of the Weighted Ranking method, where we have asked the students to rank the 5 types of ticketing options they have and their choices have been converted to weighted points , which then we have ordered to get the final ranking.

Formula used: Total Weighted Points = (Rank*5) + (Rank*4) + (Rank*3) + (Rank*2) + (Rank*1)

From the table we can see that Paper tickets rank 1st even among student commuters. E-QR tickets rank 2nd followed by Kochi 1 smart card at 3rd place. The 4th rank goes to unlimited trip passes and the 5th and final rank goes to unlimited trip passes for students.

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Table 3.17 Student Respondent's Preference for different types of tickets

Sr. No	Different Types of Ticket options	No: of Student Respondents who gave Rank 1	No: of Student Respondents who gave Rank 2	No: of Student Respondents who gave Rank 3	No: of Student Respondents who gave Rank 4	No: of Student Respondents who gave Rank 5	Total Weighted Points	Final Rank
1	Paper QR Tickets	14	3	6	3	2	108	1
2	E- QR Tickets	2	17	3	3	3	96	2
3	Kochi 1 Smart Card	9	1	13	0	5	93	3
4	Unlimited Trip Pass	1	4	4	13	6	65	4
5	Unlimited Trip Pass for Students	2	3	2	9	12	58	5
	Total	28	28	28	28	28	420	

Source: Primary Data

Figure 3.17 shows the student preference for the different types of tickets in the form of a pie chart.

STUDENT PREFERNCE FOR DIFFERENT TYPES OF TICKETS
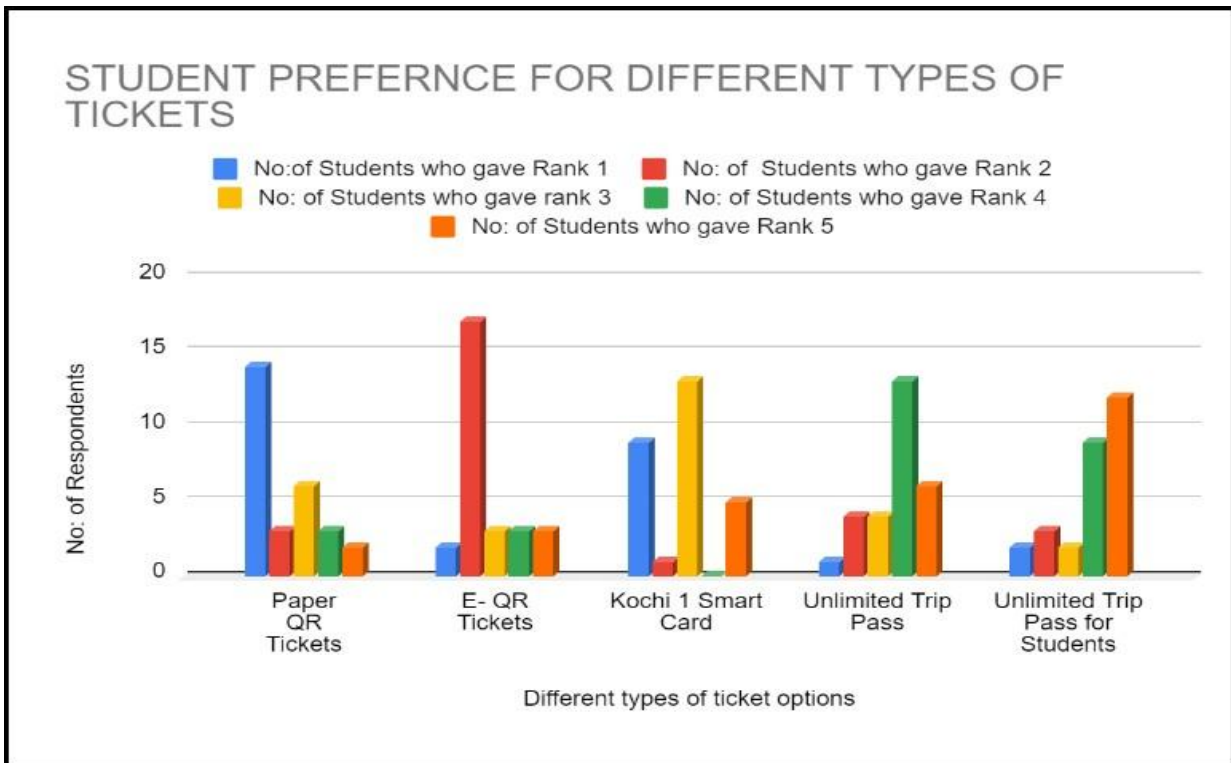
Figure 3.17   Source: Primary Data

3.7. AWARENESS AND FREQUENCY OF USAGE OF KMRL'S ADDITIONAL TRANSPORTATION SERVICES AMONG RESPONDENTS

The goal of KMRL is to build an integrated transportation system in the city and to achieve that goal they have launched services like autos, rental cycle, feeder buses and water metro to connect every part of the city and convert it into a network. This plan can be fulfilled only if there's a common ticketing and command and control system for this network, that's the aim of launching smart cards and application to digitalise this expansion and make it into a single platform. Though metro has been making these loud attempts, it's important to know how these attempts impact people of the city, their level of awareness and usage of these amenities is what makes this a success. So it's important to find these stats so that we can draw finding about the extent to which they know about these facilities and use it and how this can be further improved to match the comfort of the people.

3.7.1. RESPONDENTS AWARENESS REGARDING USES OF KOCHI 1 METRO CARD

As mentioned earlier integrating transportation services does not just involve putting together a lot of services, but also a medium that can help fulfill getting the complete access to these services. This is why metro has in partnership with Axis bank come up with the Kochi 1 Smart card. It's a travel card that's like regular prepaid card that can be multipurpose in nature. One can use it not just for travelling via the metro, but also for shopping and paying parking tickets etc. But the real question is if people are aware of these facilities the card has to offer and are able to utilise it to its fullest potential.

Table 3.18 shows the level of awareness of the respondents regarding the uses of thcard and the extent to which they exploit it. It can beseen that 38.5% of the respondents don't use the card at all. 30.8% who do use the card are aware of its features, yet use it only as a travel card. 21.2% of the respondents were aware of the cards features and use it for those purposes ass well. 9.6% of the respondents were unaware of the card's offerings and hence used it just for travelling.

Table 3.18 Respondent's Awareness about uses of Kochi 1 Metro Card

Sr.No	Respondents awareness and usage of Metro card	No: of Respondents	Percentage (%)
1	Aware; but use only for travelling	16	30.8
2	Aware ; use it for other purposes as well	11	21.2
3	Unaware; hence only use it for travelling	5	9.6
4	Don't use metro card at all	20	38.5
	Total	52	100

Source: Primary Data

Figure 3.18 shows the level of awareness of the respondents concerning the uses of the metro card and the extent t which they have utilised it.

RESPONDENT'S AWARENESS REGARDING THE USES OF METRO CARD

16 (30.8%)
11 (21.2%)
20 (38.5%)

● Aware; but use only for travelling ● Aware ; use it for other purposes as well
● Unaware; hence only use it for travelling ● Don't use metro card at all
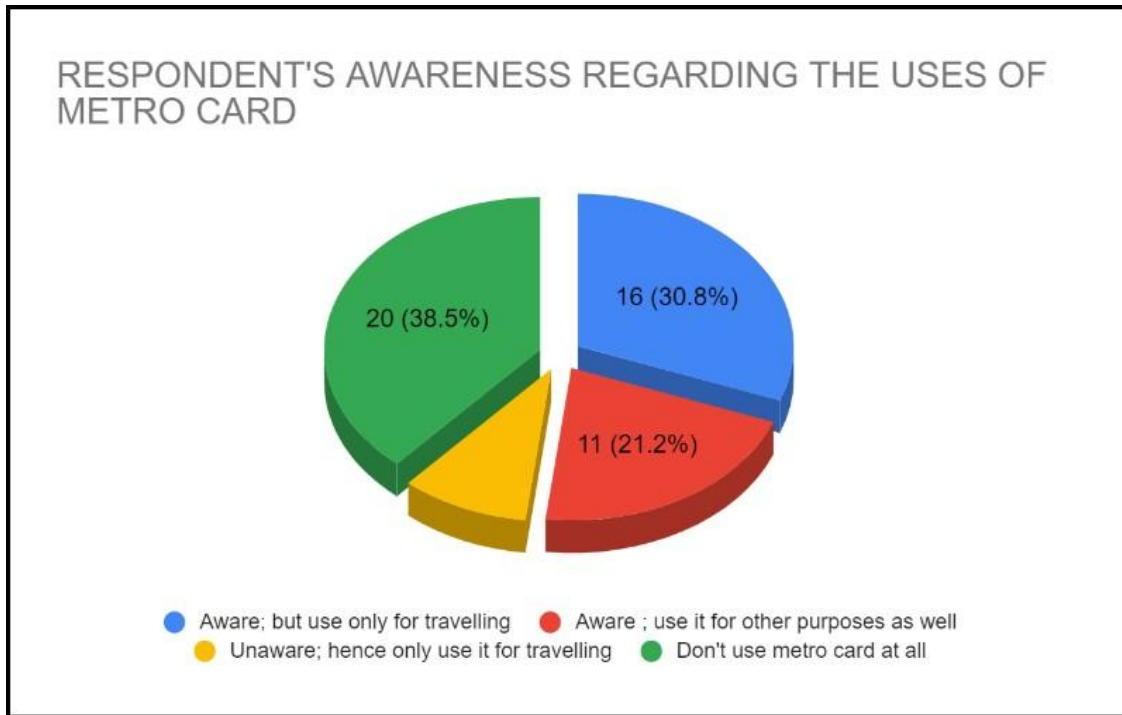
Figure 3.18   Source: Primary Data

3.7.2. AVERAGE DISTANCE FROM METRO STATIONS TO DESTINATION

Benefits of KMRL'S additional transportation services and frequency of it's usage among the respondents will depend on the average distance that they have to cover to get to the metro station from their home and to the final location from the metro station

Table3.19 shows the average distance that the respondents have to cover to get to their final destination. It can be seen that 32.7% of the respondents need to travel 0.5 km-1 km to get to their desired place. 28.8% have to cover more than 2 km to get to their destination. 25% have to cover 1 km-2 km and finally 13.5% of the respondents have to cover less than 500 m to get to their desired location.

Figure 3.19 shows the average distance that the respondents have to travel to get from the metro station to their final location in form of a pie chart.

Table 3.19 Average distance from the Metro stations to final location

Sr.No	Average distance from metro station to desired location	No: of Respondents	Percentage (%)
1	< 500 m	7	13.5
2	0.5 km - 1 km	17	32.7
3	1km - 2 km	13	25
4	> 2 km	15	28.8
	Total	52	100

Source: Primary Data

Figure 3.19   Source: Primary Data

3.7.3. PREFERENCE REGARDING MODE OF SECONDARY TRANSPORT FROM METRO STATION TO FINAL LOCATION

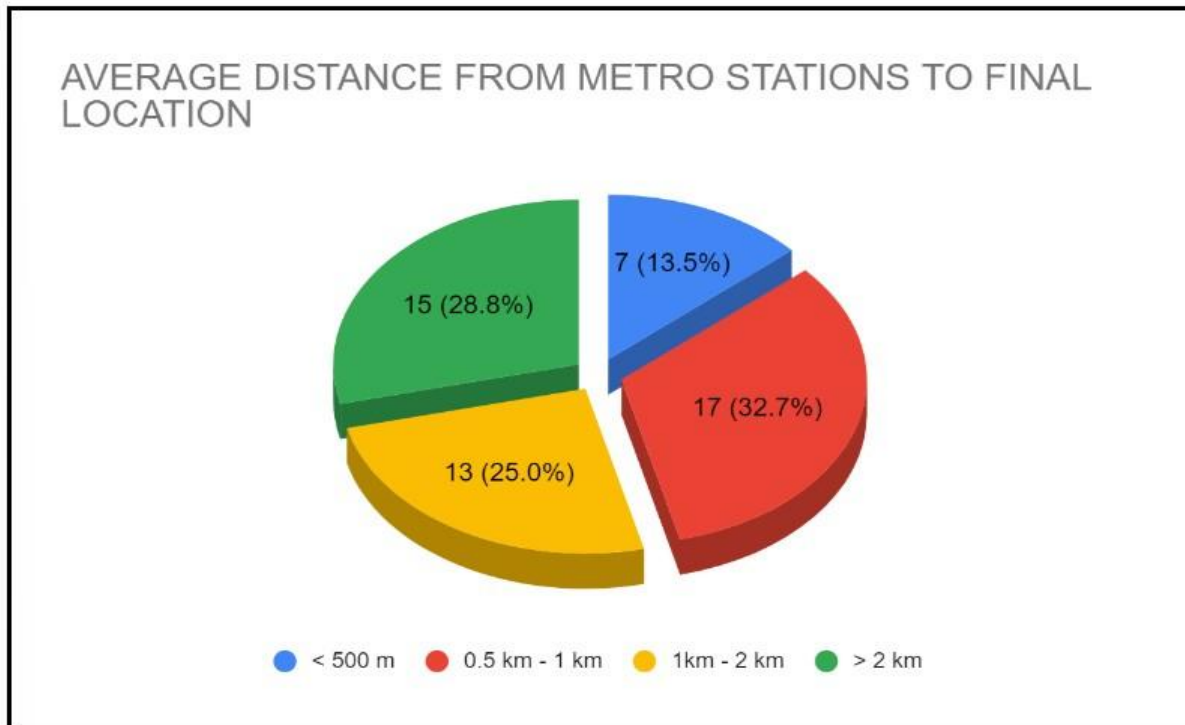Considering the distance to or from the metro station to the desired location, people have different choices of secondary mode of transportation. Table 3.20 shows the respondent's preference of the various modes of secondary transportation. Here we have made use of the Weighted Ranking method. We have found out the different ranks individual respondents gave to each mode of transport and multiplied it by weights to get the total weighted points for each of the mode. Then the different modes have been given the final ranks.

Formula used: Total Weighted Points= (Rank1*5) + (Rank2*4) + (Rank3*3) + (Rank4*4) + (Rank5*5)

It can be seen in the table that Walking has ranked 1st, followed by Bus (Private/KSRTC) at 2nd place. The 3rd position goes to Auto rickshaw, 4th rank goes to personal vehicles and the final or 5th rank is for taxi. This order hence shows the preference of the respondents regarding their secondary mode of transport, 1st rank being the most preferred and 5th being the least.

Figure 3.20 shows the preference of the respondents regarding the various modes of secondary transportation that they use to get from /to the metro station from/to their initial/final location.

Table 3.20 Respondent's Preference of Various Mode of Secondary Transportation

Sr. No	Preference for different modes of secondary transport	No: of Respondents who gave Rank 1	No: of Respondents who gave Rank 2	No: of Respondents who gave Rank 3	No: of Respondents who gave Rank 4	No: of Respondents who gave Rank 5	Total Weighted Points	Final Rank
1	Walking	28	8	5	2	9	200	1
2	Bus (Private/ KSRTC)	5	19	13	12	3	167	2
3	Own Vehicle	5	9	19	16	3	153	4

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4	Auto Rickshaw	7	15	13	15	2	166	3
5	Taxi	7	1	2	7	35	94	5
	Total	52	52	52	52	52	780	

PREFERENCE REGARDING MODE OF SECONDARY TRANSPORTATIONS
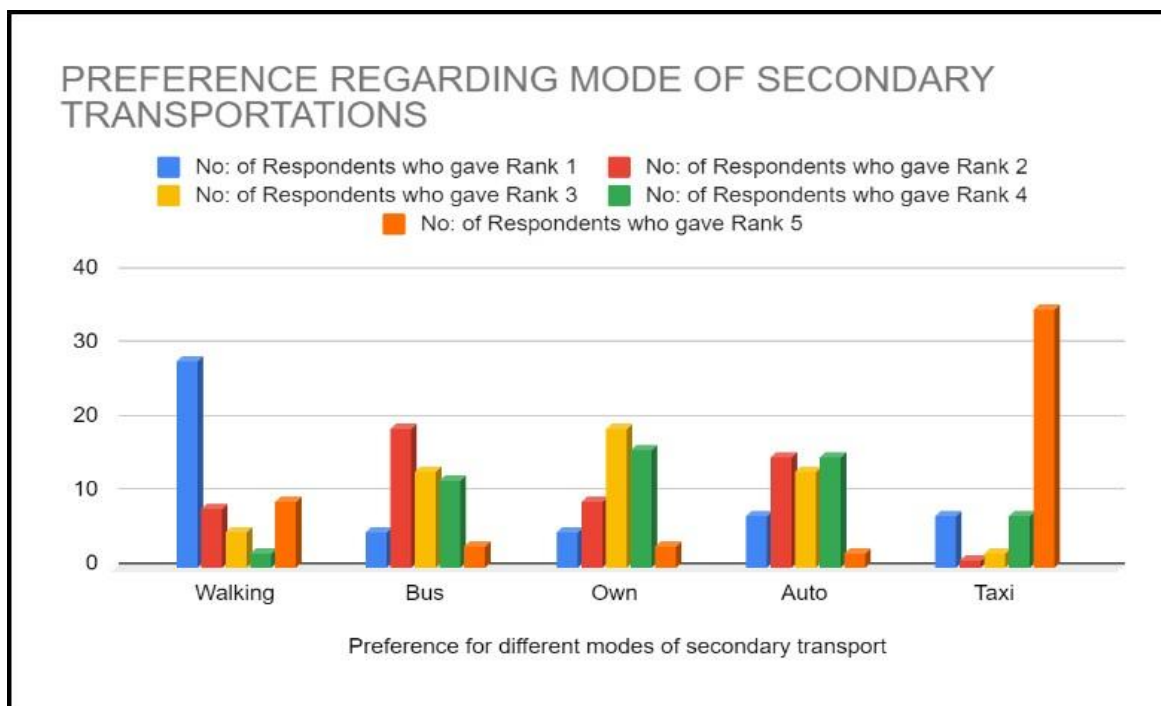
Figure 3.20   Source: Primary Data

3.7.4. AWARENESS ABOUT LAST MILE CONNECTIVITY SERVICES OFFERED BY METRO

Kochi Metro offers a handful of last mile connectivity services as part of forming this transportation network in the city. Table 3.21 shows the awareness of respondents regarding the existence of these services offered by metro. Out of the total 52 respondents, 34 were aware of the Feeder bus that operated from Aluva station to CIAL, while 18 were unaware. 35 respondents were aware of the Metro auto, which are electric share autos , while 17 were unaware. Finally 36 of the respondents were aware of the rented cycles service of Metro while 16 remained unaware.

Figure 3.21 show the awareness of the respondents of the different modes of last mile connectivity offered by metro in the form of a bar graph.

Table 3.21 Respondent's Awareness about last mile connectivity services offered by Metro

Sr.No	Different modes of last mile connectivity measures offered by metro	No: of Respondents who were aware about it	No: of Respondents who were not aware of it	Total
1	Feeder Buses (Aluva to CIAL)	34	18	52
2	Metro Auto	35	17	52
3	My bike	36	16	52

Source: Primary Data

RESPONDENT'S AWARENESS ABOUT LAST MILE CONNECTIVITY MEASSURES OFFERED BY METRO
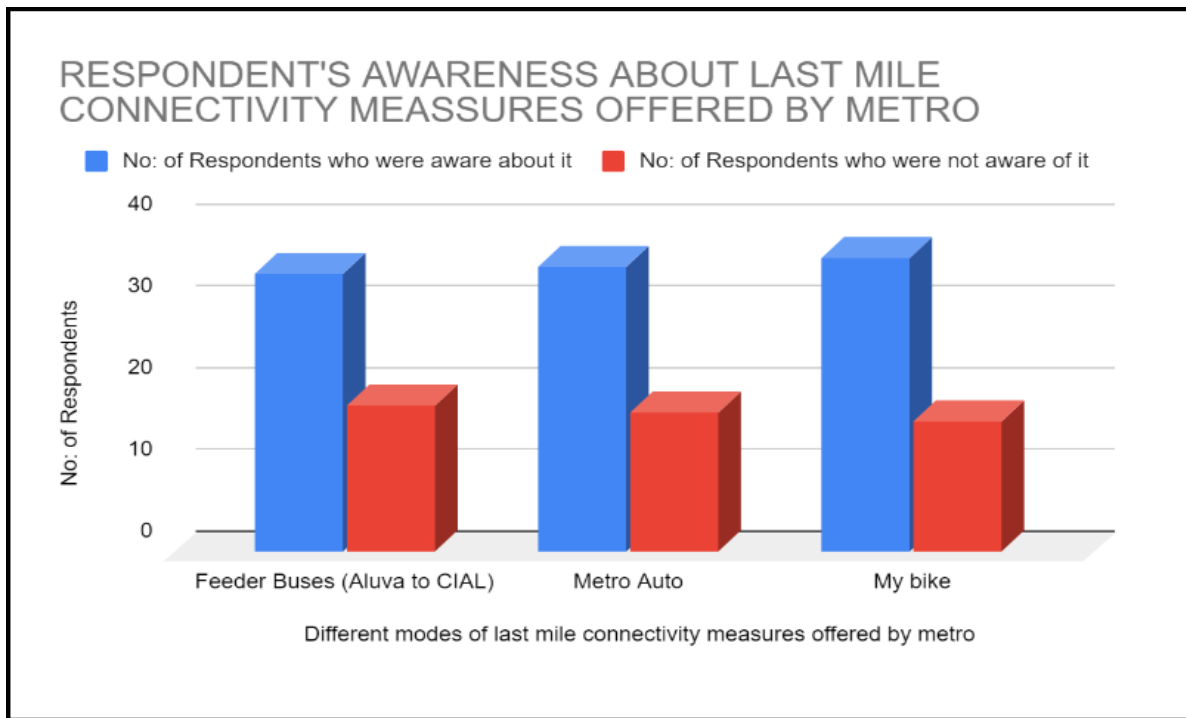
Figure 3.21   Source: Primary Data

3.7.5. RESPONDENTS USAGE OF THE METRO LAST MILE CONNECTIVITY SERVICES

Table 3.22 shows the no: of respondents who have made use of the lat mile connectivity services that KMRL offers. The respondents were allowed multiple choices as they could have used more than one of these additional services. 21.2% of the respondents have used the feeder bus from Aluva to CIAL. 28.8% have used the metro auto, while 25% of the respondents have used the My bike cycles. 40.4% of the respondents have not used any of these services.

Figure 3.22 shows no: of respondents who have made use of Metro's Last mile connectivity services and those who have not in form of a bar graph.

Table 3.22 Respondent's Usage of Metro's Last mile connectivity services

Sr.No	Metro's last mile connectivity services	No: of respondents who have used this service	Percentage (%)
1	Feeder bus	11	21.2
2	Metro Auto	15	28.8
3	My bike	13	25
4	None of the above	21	40.4
	Total	60	

Source: Primary Data

NOTE: Some of the respondents have selected more than one option so the no: of responses have outnumbered the respondents.
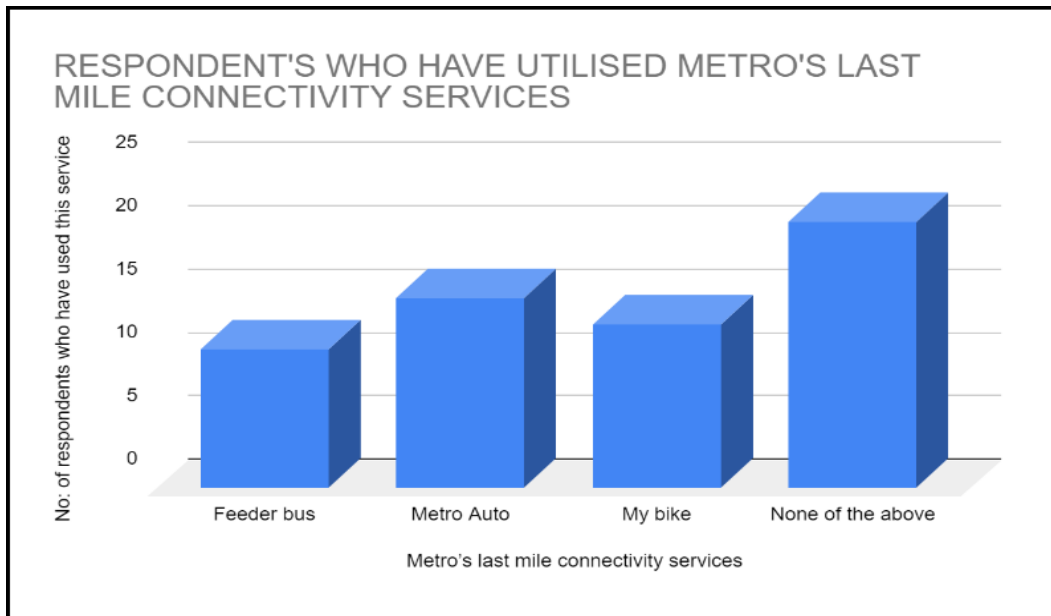
Figure 3.22   Source: Primary Data

3.7.6. RESPONDENTS OPINION ON UNITS NEEDED OF METRO'S LAST MILE CONNECTIVITY

People who have made use of the last mile connectivity services were asked about the unit requirements of Metro's last mile connectivity services to suit their requirements. Table 3.23 shows their opinion as to if or not a particular last mile connectivity service of Metro requires additional units. Out of the total 52 respondents, 29 felt there was a need for more Feeder buses from Aluva to CIAL, while 23 remained unconcerned.40 respondents said there was a need for more of the Metro autos, while 12 remained indifferent. Finally, 24 respondents felt the need for more units of My bike whereas 28 were unconcerned about it.

Figure 3.23 shows the no: of respondents who said there was a need for more units and those who remained unconcerned about the number of units of Metro's last mile connectivity services in the form of a bar graph

Table 3.23 Respondent's opinion on the unit requirements of Metro's Last mile connectivity services

Sr.No	Type of last mile	No: of Respondents who	No: of Respondents who	Total

	connectivity measure	think more units are required	are Unconcerned	
1	Feeder Bus (only in Aluva)	29	23	52
2	Metro Shared Auto (MG Road)	40	12	52
3	Metro MY Bike	24	28	52

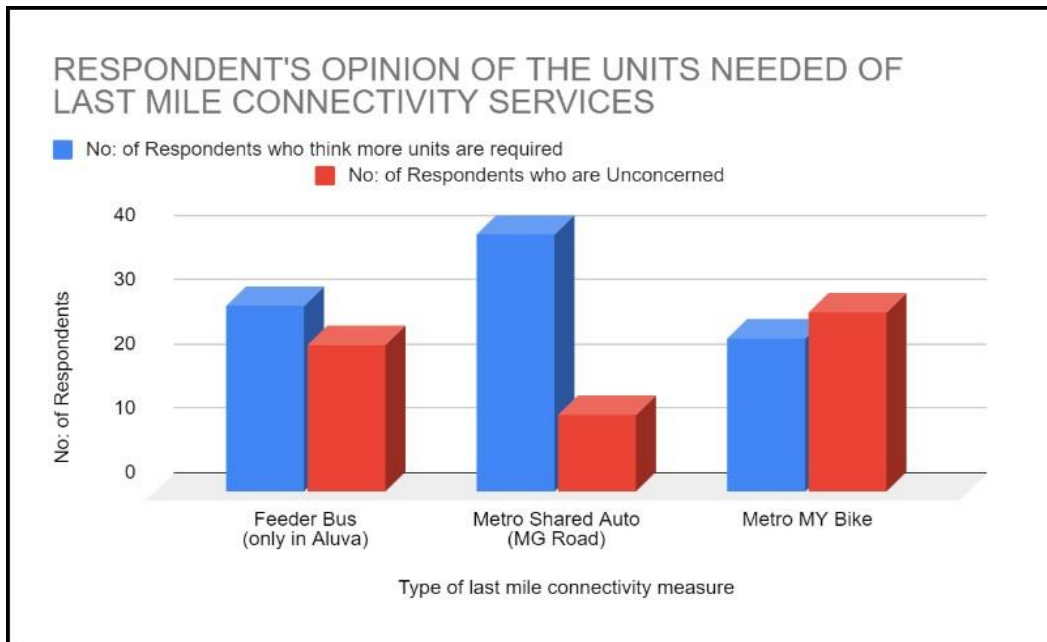Source: Primary Data

Figure 3.23   Source: Primary Data

3.7.7. USEFULNESS OF WATER METRO TO THE RESPONDENTS

The latest addition to Metro's integrated city transport is the Water Metro, which doe take KMRL a giant leap closer the network formation, but the usefulness of Water Metro will vary from person to person depending on their residential location. Table 3.24 shows the respondents opinion on the extent to which the Water Metro would be useful for them.51.9% of the respondents think that the Water Metro will be useful to them. 42.3% consider it to be not of use to them, while 5.8% consider the water metro to be extremely useful to them.

Figure 3.24 shows the respondent's opinion on the usefulness of the Water Metro for them in form of a pie chart.

Table 3.24 Extent of usefulness of Water Metro to the Respondents

Sr.No	Extent to which Water Metro will be useful to the Respondents	No: of Respondents	Percentage (%)
1	Extremely Useful	3	5.8
2	Useful	27	51.9
3	Not Useful	22	42.3
	Total	52	

Source: Primary Data

USEFULNESS OF WATER METRO TO THE RESPONDENTS

22 (42.3%)   27 (51.9%)

● Extremely Useful   ● Useful   ● Not Useful
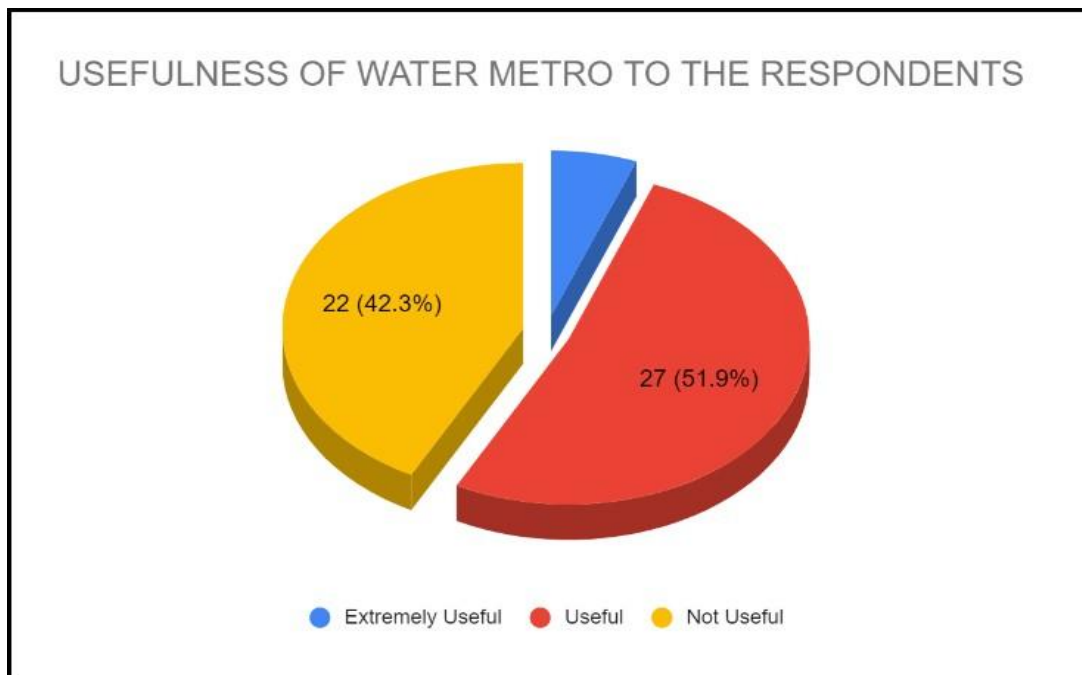
Figure 3.24   Source: Primary Data

3.7.8. PROBABLE FREQUENCY OF USAGE OF WATER METRO

The study was conducted before the launch of Water Metro, due to this limitation, the questionnaire was set in such a way as to get the probable frequency of usage of Water Metro by the respondents based on what they think they would utilize it like. Table 3.25 shows this probable frequency. 50% of the respondents said that they would Rarely use the Water metro.25% of the respondents were of the opinion that they would use it on an occasional basis, while 13.5% said they would probably never use it. 7.7% of the respondents said they might end up using it often and 3.8% said they would use it Always.

Figure3.25 shows the respondent's probable frequency of usage of the Water Metro in the form of a pie chart.

Table 3.25 Probable Frequency of Usage of Water Metro by the Respondents

Sr.No	Probable Frequency of usage of water metro	No: of Respondents	Percentage (%)
1	Always	2	3.8

2	Often	4	7.7
3	Occasionally	13	25
4	Rarely	26	50
5	Never	7	13.5
	Total	52	

PROBABLE FREQUENCY OF USAGE OF WATER METRO BY THE RESPONDENTS

7 (13.5%)

13 (25.0%)

26 (50.0%)

Always   Often   Occasionally   Rarely   Never
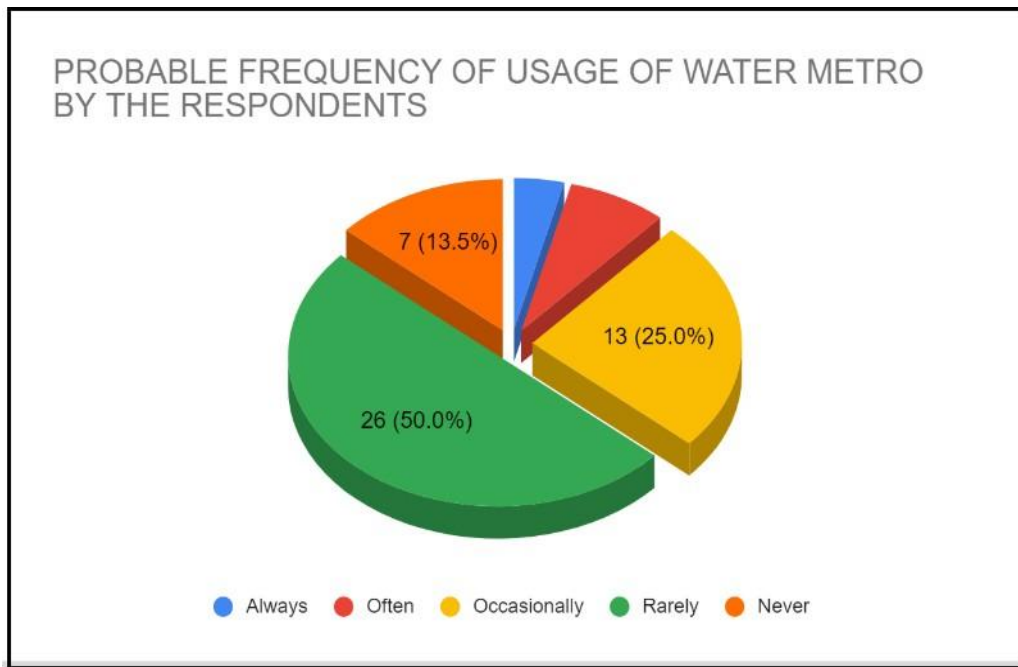
Figure 3.25   Source: Primary Data

CHAPTER 4

FINDINGS, RECOMMENDATIONS AND CONCLUSIONS ON THE IMPACT OF TRANSPORT INTEGRATION INITIATIVES OF KMRL ON YOUTH

4.1. INTRODUCTION

Kochi Metro being a Rapid Transit system in the city of Cochin aims at becoming a unique network that integrates rail, road and water transport facilities. From the reviews of literature it as been noted that people in the city were extremely optimistic of the establishment of Metro system in a city like Kochi were roads are narrow and people are constantly looking forward to shift to a light public mode of transportation that's fast, safe and economical. Kochi Metro's plan of integrating the city's transportation system can be fulfilled only by establishing a common ticketing and Command and Control web, and for achieving this they have brought some innovative digitalizing initiatives as a virtual platform is more practical in the current era of technology.

They have brought into the scene Smart cards and Applications that have multiple utility to ensure that people are able to access any of the services they require from KMRL through a single application. This project is a humble study to find out the impact of this transport integration initiatives of Metro which includes a number of Digitalizing initiatives and additional last mile connectivity services by the Metro on the "youth" population of the city. The responses from the publicly distributed questionnaire served as the primary data for the study. From the total number of 61 respondents, 52 eligible responses were selected based on the age bar that we had set i.e. people in the age group of 18 and 35. Their data was then analysed to gain an understanding on the 3 key objectives of the study. The first objective was to find the extent of digitalisation of Kochi Metro rail transportation among he defined population. With respect to the scope of digitalisation we have only considered the more obvious aspect like ticketless travel and cashless transactions. A basic background data was collected about the respondents and in order to understand the first objective, frequency of metro travel and ranking questions on their

preference regarding ticket types and mode of payment were asked about. After analysis we were able to conclude that most our respondents travelled via Metro occasionally i.e. few times a month and they preferred using the paper QR tickets and paying with cash. The second objective was to find out the popularity of the different pricing strategies used by KMRL which is meant for not just attracting customers but also towards shifting their usage towards the online or paperless modes of travelling and cashless modes of transactions. The second objective hence reinforces the conclusions from the 1st objective by giving the readers an idea about the scope of these pricing strategies to successfully induce people to digitalize. For this we have looked into the respondent's awareness about various pricing schemes used by Metro and also the extent to which they g to utilize it, which will ultimately give us a view about its success among people and in influencing their decisions. From the analysis of the data we were able to observe that that was a stronger inclination among people to go for paper tickets despite it being devoid of any discounts. The third objective was to study the benefits of KMRL's additional transportation services or last mile connectivity measures as well as the frequency of its usage among the respondents. This was done by collecting and analyzing data on the awareness of the respondents regarding various initiatives of last mile connectivity services and their actual and probable frequencies of usage of those services. It was found out that most of our respondents had to travel 0.5 km – 1 km to get to their final locations from the metro stations and their most preferred mode of secondary transportation was walking, followed by the buses. Among the connectivity services offered by Metro, though a major number of respondents seem to be aware of the existence of such services, there was a considerable portion of commuters who had never made use of any of these modes. Lastly it was also observed that more than half of the respondents consider the new Water metro services to be useful to them. The finding have been written in full detail below.

4.2. FINDINGS

The project "Impact of Transport integration initiatives of KMRL on youth: A study with reference to Ernakulam" aims to study the effects that the various transport integration measures of KMRL with respect to digitalisation and Last mile connectivity services has had on the defined age group. The project focuses on a sample of 52 respondents in the 18 – 35 age categories in Ernakulam city to study the 3 key objectives of the research.

1. The basic backgrounds of the respondents were found out with the help of 5 questions to cement the distinctiveness of the sample. From the data it was found that :

- We got a total of 52 respondents who belonged to the 18-35 age categories. 23.1% of the respondents belonged to 22 years group, making them the largest group. Following this, the next significant age groups were 23 years with 13.5%, 24 years with 7.7%, 25 years with 9.6% and 26 years with 7.7% of the respondents. The only 2 age groups with zero respondents were 27 and 34 years category.

- Most of the respondents were females in the study. They occupied 53.8% of the total number of respondents. Considering the occupation of the respondents, majority of them i.e. 53.8% were students. 34.6% of the respondents were working and the rest were non working or homemakers.

- Place of residence of the respondents was asked for to give more distinctiveness to the data regarding the most frequented stations by the respondents. It was seen that a significant number of respondents came from Edappally (11) followed by Kalamassery (6),Kaloor (6) and Aluva (5) which are actually places were metro is on high demand. The respondents were given the option to choose 3 of the most frequented stations and the top 5 most frequented stations for the respondents were Edappally (23.7%), Aluva (13.5%) , Maharaja's College (12.8%), Kaloor (7.7%) and Kalamassery (5.8%). These conclusions clearly are in alignment with the purpose of travel of the respondents. It was found out that 38.8% of the commuters used metro for shopping. This is exactly in line with the most frequently visited station which was Edappally. 29.4% used it to get to educational institutions which explains why a significant number of respondents chose Maharaja's college and Aluva station to be their most frequented stations.

2. The respondents were asked about the frequency of usage of Metro. This is a n important aspect that will influence the impact any of the transport integration initiatives will have on the respondents. Only someone who uses the Metro regularly will be more influenced by the different initiatives of the Metro and attracted to the schemes they have to offer. A significant number of our respondents (34.6%) were those who used the Metro on an Occasional basis i.e. few times a month. Only 26.9% of the respondents were daily users.

3. We must examine the youth's tastes for the various Metro ticketing alternatives available as well as their preferred method of payment to determine how much the Metro is digitalized among this population.

- It was concluded from the data that the most preferred form of ticket among the people is the paper QR ticket and the most preferred form of payment still turns out to be cash, possibly due to the fact that a significant portion of the respondents use Metro only Occasionally and also due to considerable simplicity of getting a ticket over the counter.

4. In order to draw in more customers and promote the digitalization of transit, Kochi Metro has been releasing a variety of pricing plans connected with various ticketing choices. The company's overarching goal is to integrate the whole transport network in the city, and they intend to do this by putting in place a centralised ticketing and command and control system for all activities taking place within this network. Kochi Metro employs a variety of pricing tactics to persuade more people to use digital ticketing rather than standard paper tickets, the most prominent ones being peak load pricing and discounting. The respondents choices based on the pricing policies gives added perspective to the first objective of the extent of digitalisation. This is due to the fact that Metro offers most of the discounts on cashless and ticketless modes of travel. This is clearly with a bigger aim of digitalizing the network along with attracting more customers.

   - Regardless of all the discounts on the virtual tickets and Metro cards, 59.6% of the commuters still prefer the regular paper tickets devoid of any discount for most of their travels.

   - Metro has tried to balance their service demand, by offering up to 50% discount during the non peak hours. It was seen that 63.5% of the respondents didn't necessarily prefer travelling in the non peak hours and even despite the discounts offered a significant number of respondents (28.8%) remained Neutral towards travelling during the non peak hours. This again could be due to the fact that a good number of our respondents are just occasional users and also due to the fact that they don't need to get to their jobs or possible errands as early in the morning or late in the evening.

   - Regarding awareness of the different pricing schemes that metro has to offer, it was seen that more than half of the respondents were aware of the discounts offered in each of different cases, except for the case of discounts in the trip passes.

   - Keeping the fact that a vast majority of the respondents were aware of the discounts they have possible access to, we have tried to find out the preference for

the different ticket options but this time emphasizing the fact about the available discounts. It was found that more than 50% of the respondents were indifferent towards using these tickets buying options despite the discounts, possibly due to the hassle of getting the Kochi 1 App or Kochi 1 card issued, or going during the extremely specific non peak hours or the lack of need for trip passes.

5. Student respondent's opinion was taken separately in case of pricing scheme related questions as they form a majority of the total respondents and also due to the fact that Metro offers special trip passes for them. it was important to know if they do prefer utilizing these options and find it affordable or are simple indifferent.

   - The student commuters were asked about their ticket preferences while travelling and it turns out that paper qr tickets still remain th e1st choice over here as well. In fact ironically, unlimited trip passes for student ranked last to be the least preferred type of ticket.

   - About 60.7% of the student respondents think that the unlimited travel passes for them is Affordable. The student commuter's preference regarding usage of special unlimited passes for them was split. 50% preferred to use it while the other 50% were indifferent.

6. In order to realize its objective of creating an integrated transport system for the city, KMRL has introduced services including autos, rental cycles, feeder buses and water metro, which connect the entire city and turn it into a network. This strategy can only be carried out if the network has a common ticketing and command and control system, which is why smart cards and applications are being introduced in an effort to digitalize the expansion and turn it into a single platform. Despite Metro's vocal efforts, it's crucial to understand how these efforts affect local residents. Their awareness of and use of these services is what makes this a success.

   - Considering respondent's awareness about the potential of the Metro cards and their use of it, we have observed that 30.8% of the respondents were aware of the various uses of the card, but used it just for travelling in the metro. On the other hand, 38.5% of the respondents didn't use the card at all.

   - The significance of metro's last mile connectivity comes with the distance that people have to cover to/from the metro station to/from the initial/final location. The data has shown that 32.7% of the respondents had to travel 0.5 km - 1 km to

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get to their desired locations and the top mode of means to get to the final location for them is walking, followed by buses.

- Considering their awareness, preferences and usage of Metro's own last mile connectivity services, it was seen that more than half (>50%)of the respondents were aware of the presence of Feeder buses metro autos and my bike cycles and also feel the need for more number of units concerning the feeder buses and metro autos. 28.8% of the 52 respondents have used the Metro auto, while 25% have used the cycles and 21.2 % have used the feeder buses, yet 40.4% of the 52 respondents have never used any of these 3 services.

- The latest addition to KMRL's transport network was the water metro.51.9% of the respondents felt that the Water Metro services would be of use to them. When they were asked about the probable frequency of their usage of the Water metro, it was seen that 50% of our respondents thought they would rarely make use of the Water metro, whereas 25% thought they would be using it occasionally, only 3.8% were expecting themselves to use it on a daily basis.

4.3. RECOMMENDATIONS

The finding from the section above shows many possible areas where improvement can be made by the Metro to attract more people as well as influence them to shift to the digitalized way of travelling which will ultimately help achieve the larger goal of transport integration.

1. Though the Review of literature tells that people have well adopted the system of smart cards and Kochi 1 app, the data from the respondents still shows paper tickets and cash to be the biggest preference of the people. So it can be recommended that metro urge users convert from paper tickets and promote the e QR tickets instead, just like they did in case of the water metro. Therefore idealizing booking tickets digitally for Metro mode of travel should be done. This shouldn't be very difficult considering how metro provides free wifi services to the commuters to promote digitalisation

2. Though majority of the respondents are aware of the pricing schemes of metro that offers considerable discounts on the prices, when it comes to actual usage , they seem to be indifferent between the paper tickets and those options if not more incline towards the paper tickets. It can be recommended that Metro should heavily promote the usage of Kochi 1 app as the primary mode of booking tickets and should withdraw the paper tickets slowly.

3. Despite the awareness of the last mile connectivity measures among majority of the respondents, a significant portion of the commuters don't use metro's last mile connectivity. It's highly recommended that KMRL increase the n: of services of the feeder bus from Aluva to CIAL as well as increase the number and the ease of availability of the electric share autos. They should try to make the metro auto the standard of the city and promote auto pooling more.

4.4. CONCLUSION

The Kochi Metro, a rapid transit system in Cochin, strives to create a distinctive network that combines rail, road, and water transportation infrastructure. In a city like Kochi, where roads are narrow and people are constantly looking forward to switching to a light public mode of transportation that's fast, safe, and affordable, it has been noted from reviews of literature that people in the city were extremely optimistic about the establishment of the Metro system. Only by creating a common ticketing and command and control web will Kochi Metro's plan to integrate the city's transport system be realized, and in order to do this, they have introduced some creative digitalizing initiatives because a virtual platform is more practical in the present technological era.

This study was conducted keeping 3 key objectives in mind. Analysis of the study was done with the help of the data collected from questionnaire distributed. We gained a total of 52 eligible responses from it who would fit into the defined age group of 18-35 .From the data it was understood that most our respondents were students (53.8%). Most of the respondents (38.8%) travelled via Metro for the purpose of shopping which does tally with the fact that the most frequently visited station by the a significant portion of the respondents was Edappally metro station that directly connects to the Lulu mall. The frequency of usage of the Metro by 34.6% of the respondents was in an occasional basis i.e. few times a month. This fact could have a major impact on the extent to which the respondent's decisions are influenced by the pricing schemes offered by metro to attract customers as well as promote digitalization due to the fact that regular or daily users are the ones who have a higher tendency towards adopting the ticket options that are more digitalized and cheaper. The other occasional users would rather prefer the simple paper tickets that can be bought over the counter with cash without the hassle of getting a smart card or app. True to our intuition, the study shows that the respondents actually prefer the paper tickets as the most used form of tickets and cash as the most frequently used mode of payment.

From the study it can be clearly understood that commuters prefer the paper tickets rather than the digitalized option despite the discounts offered on it, possibly due to the ease of getting it. Metro has in addition made an effort to balance the demand for its services by providing discounts of up to 50% off during off-peak times. It was discovered that 63.5% of respondents didn't necessarily favors travelling during non-peak hours, and even after being provided with discounts, a sizable portion of respondents (28.8%) remained Neutral about travelling during non-peak hours. This may be because many of our respondents only use the service sometimes and because they don't need to leave for work or other prospective tasks as early in the morning or as late in the evening. The most important details in this text are that more than half of the respondents were aware of the discounts offered in each of the different cases, except for the case of discounts in the trip passes. However, more than 50% of the respondents were indifferent towards using these tickets buying options despite the discounts, possibly due to the hassle of getting the Kochi 1 App or Kochi 1 card issued, or going during the extremely specific non peak hours or the lack of need for trip passes. The student commuters were asked about their ticket preferences while travelling and it was found that paper QR tickets still remain the first choice. The student commuter's preference regarding usage of special unlimited passes for them was split, with 50% preferring to use it while the other 50% were indifferent. However, despite 60.7% of the students respondents saying that the unlimited travel passes are affordable for them, unlimited trip passes for student ranked last to be the least preferred type of ticket, possible due to the lack of need to opt for it as people don't need to travel multiple times a day. Coming to the extent of usage of the additional services, KMRL has introduced services such as autos, rental cycles, feeder buses and water metro to connect the entire city and turn it into a network. Smart cards and applications are being introduced to digitalize the expansion and turn it into a single platform. Despite Metro's vocal efforts, it is important to understand how these efforts affect local residents. 30.8% of respondents were aware of the potential of the Metro cards and used them just for travelling in the metro, while 38.5% didn't use the card at all. The significance of metro's last mile connectivity comes with the distance that people have to cover to/from the metro station to/from the initial/final location. The top mode of means to get to the final location for respondents is walking, followed by buses. Concerning, Metro's own last mile connectivity as a preferred mode of secondary transportation ,it was seen that more than 50% of respondents were aware of the presence of feeder buses, metro autos and my bike cycles, and feel the need for more units. The latest addition to KMRL's transport network was the Water Metro, with 51.9% of respondents feeling that the services would be of use to them. When asked about the

probable frequency of their usage, 50% of respondents thought they would rarely make use of the Water Metro, 25% thought they would be using it occasionally, and 3.8% were expecting themselves to use it on a daily basis.

Thus it can be concluded that the impact of the transport integration initiatives of KMRL which includes bringing the ticketing onto a digital platform and also creating a network of transport services has scope to expand in the city. The one thing that does influence the extent to which these measures affect people and mange to influence their decisions is the frequency of usage of metro. Our respondents from the study were mainly occasional users who used it for the purposes mainly like shopping. The number of regular users of metro is expected to vastly increase upon the launch of phase 2 and phase 3 which will bring in a lot more working passengers. It's through them that the step to digitalization can be taken up to the level it has to reach. The scope of Metro's last mile connectivity services also can reach the potential if the number of services of the feeder buses and number of shared electric autos in the city increases. There's huge potential for metro to convert the city into a digitally integrated transport network,

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ANNEXURE – 1

QUESTIONNAIRE

1. AGE

2. Occupation

   a) Working
   b) Student
   c) Home maker
   d) Other:

3. Frequency of using the metro.

   a) always (daily basis)
   b) often (few times a week)
   c) Occasionally (few times a month)
   d) rarely (few times a year)
   e) never

4. Place of Residence

5. Select 3 stations you frequently visit.

   a) Aluva
   b) Pulinchodu
   c) Companypadi
   d) Ambattukavu
   e) Muttom
   f) Kalamassery
   g) CUSAT
   h) Pathadipalam
   i) Edappally
   j) Changampuzha Park
   k) Palarivattom
   l) JLN Stadium
   m) Kaloor
   n) Town Hall
   o) MG Road
   p) Maharaja's College Ernakulam
   q) South
   r) Kadavanthara

s) Elamkulam

t) Vytilla

u) Thykoodam

v) Petta

w) Vadakkekotta

x) SN Junction

Rank based Questions For the rank based questions, provide one rank for every row provided , based on your preference. Please don't assign the same rank for 2 rows.

6. Based on your usage, rank the following types of ticket.

   a) paper QR ticket

   b) e-QR ticket

   c) Kochi 1 card

   d) limitless travel passes

7. Based on your usage, rank the following mode of payment used to buy metro tickets.

   a) Cash

   b) Cards (credit /debit)

   c) Kochi 1 smart cards

   d) Online payment (Kochi1 app)

8. Do you make use of the regular paper tickets that's got no discounts for most of your travels?

   a) Agree

   b) Disagree

9. Do you frequent the Kochi metro during non peak hours? (i.e 5:45 am - 8:00am and 9:00 pm - 11:00 pm)

   a) Agree

   b) Disagree

10. You prefer traveling during the non peak hours to avail the flat 50% discount on the original prices.

   a) strongly agree
   b) agree
   c) neutral
   d) disagree
   e) strongly disagree

11. Were you aware of the availability of the following discount on metro fares?

   a) flat 50% off during non peak hours
   b) 10 % off on e – QR tickets
   c) 20% off on Kochi 1 cards
   d) Upto 60% off on trip passes

12. Do you use any of these ticket buying options to utilize the discounts? (based on your awareness of the discounts on metro fares*)

   a) Travel during non peak hours
   b) Kochi 1 app
   c) Kochi 1 card
   d) Trip passes (Kochi1 card)

13. Do you use travel passes that allow unlimited travel within a paid time period? (e.g.: daily ,weekend, monthly etc)

   a) Always
   b) Often
   c) Occasionally
   d) Rarely
   e) Never

14. Do you use the unlimited trip passes for students?

   a) Agree
   b) Disagree

15. [FOR STUDENTS] What do you think of the affordability of the unlimited travel passes when compared to other options?

   a) extremely affordable
   b) affordable
   c) neutral
   d) unaffordable
   e) extremely unaffordable

16. [FOR STUDENTS] Rank the travel options below

   a) regular paper QR ticket
   b) e- QR ticket
   c) Kochi 1 smart card
   d) unlimited trip passes
   e) unlimited trip passes for students

17. What is your purpose of travel? (via metro)

   a) Work
   b) Educational Institutions / Academy
   c) Shopping
   d) Medical Purposes
   e) Other:

18. Did you know that you could use your Kochi 1 smart card to pay for not just metro , but for buses, parking facility and shopping ? Do you make use of your Kochi 1 card for anything other than getting your metro ticket?

   a) Yes, i was aware, but i don't use the card for anything other than travelling via metro

b) Yes, i was aware and i do use it for the above given purposes
c) No, i was not aware and hence don't use it for purposes other than travelling via metro
d) No, I don't use a metro card

19. How far do you have to travel from the metro stations to get to your desired destination?

a) < 500m
b) 0.5 km - 1 km
c) 1 km - 2 km
d) 2 km

20. Rank the following mode of transport you take from the metro stations to your final location.

a) walking
b) Bus(private/ KSRTC)
c) your ownvehicle (parked at station)
d) auto rickshaw
e) taxi

21. Is there any mode of transport that you use that has not been mentioned in the above given options? If yes, specify.
22. Were you aware of the availability of these last mile connectivity services from Kochi Metro?

a) Feeder bus (aluva station to CIAL)
b) Metro auto (shared electric auto)
c) my bike (cycles)

23. Select the metro services that you have used .

a) Feeder bus (aluva station to CIAL)
b) Metro auto (shared electric auto)
c) my bike (cycles)
d) none of the above

24. Do you think metro should launch more of these ?

    a) Feeder bus (currently only in aluva)

    b) Metro shared electric autos (only in mg road)

    c) Metro my bike

25. Extent to which the water metro will be useful for you.

    a) extremely useful

    b) useful

    c) not useful

26. How often do you think you would be using the water metro services when its launched?

    a) Always

    b) often

    c) occasionally

    d) rarely

    e) never