Shikshana Prasarak Mandali's - Knowledge Repository

SIR PARASHURAMBHAU COLLEGE

ARTS | SCIENCE | COMMERCE

Tilak Road, Pune - 411030

"T.Y.BSc Statistics"

presentation on

PUNE METRO

So, lets see what Punekars' views on Pune Metro are?

INTRODUCTION

- Metro, one of the most efficient modes of transport system, carries around 150 million people everyday across the globe.
- In India, we have seen the merits of Metro in cities like Delhi, Mumbai, Chennai, etc. and how it impacts citizens
- Now, this efficient mode of transport is now going to be added to the gems of Pune

NEED OF THE PROJECT

04 Taking into consideration, the rise in population, and in urbanization of the infrastructure, to study how Metro impacts, time efficiency, cost efficiency, etc.

01 We chose this project to monitor the current progress of Pune Metro.

03 What is the people's perspective about this new mode of transport.

02 To predict how Metro would be effective against the existing modes of transport.

Objectives.

I

To study the willingness to shift to metro as a mode of transport based on factors such as

a. Convenience and Accessibility
b. Affordability
c. Comfort and Facilities
d. Safety and Security
e. Time required to reach Workspace
f. Employment Status
g. Effect of metro on current travel time
h. ETC

II

To study the people's views about Pune Metro against PMPML in terms of

a. Convenience and Accessibility
b. Affordability
c. Comfort and Facilities
d. Safety and Security

III

To compare the time required to travel by PMPML v/s Pune Metro

Statistics

DATA COLLECTION AND ANALYSIS

Primary Data:

Obtained by circulating a Google form among 190 Observations.

- Here we have used Convenient Sampling(collecting data from a conveniently available pool of respondents) and also Cluster Sampling( )
- In this data, most of Variables are categorical while few are continuous and discrete.

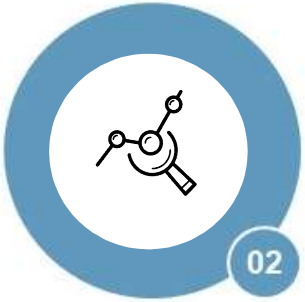
Secondary data:

- Time required for PMPML - Google Maps
- Time required for Metro
- Official site of Pune Metro Rail Project
- https://www.punemetrorail.org
- In this data, al the variables are Continuous.

STASTICAL METHODS

1. SAMPLING

Convenient sampling, Snowball sampling



2. NON-PARAMETRIC TESTS :

Chi-Square Test

3. MULTIPLE LINEAR REGRESSION

4. MEDIAN TEST

5. MANN WHITNEY U TEST

Statistical Aids

- MS-Excel
- R

DATA ANALYSIS

primary

Chi-Square Test

- It is a non-parametric Test. It is used to examine the differences between categorical variables from a random sample in order to test their goodness of fit.
- The Chi-square test of independence is a statistical hypothesis test used to determine whether two categorical or nominal variables are likely to be related or not.

Chi-square test of Independence

- Willingness to switch to metro and Employment Status

  Result: Both are independent.
- Willingness to switch to metro and Effect on Metro on travel time

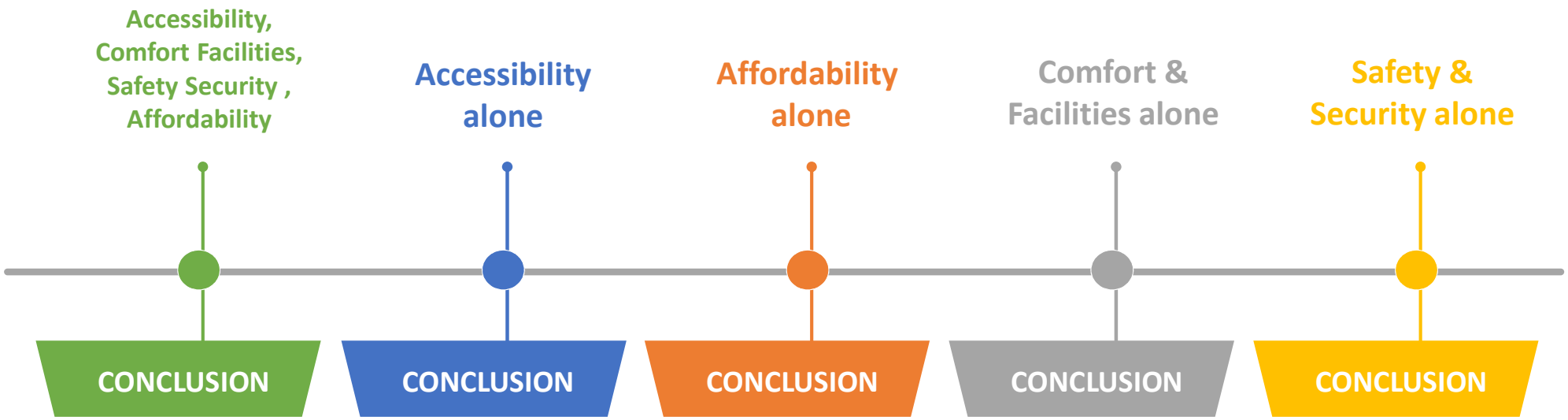
  Result: They are dependent.

Median Test

In statistics, Mood's median test is a special case of Pearson's chi-squared test. It is used to test whether two (or more) independent groups differ in central tendency - specifically whether the groups have been drawn from a population with the same median.

It tests the null hypothesis that the medians of the populations from which two or more samples are drawn are identical. The Identical hypothesis is that Median of one sample is greater or lesser than the other.

To Compare Metro and PMPML in terms of



Thus, we conclude that The median of Population under PMPML is lesser than the Median of Population under metro.

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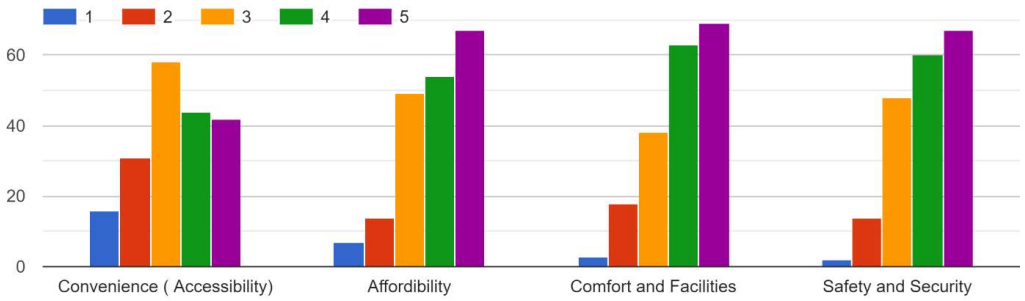
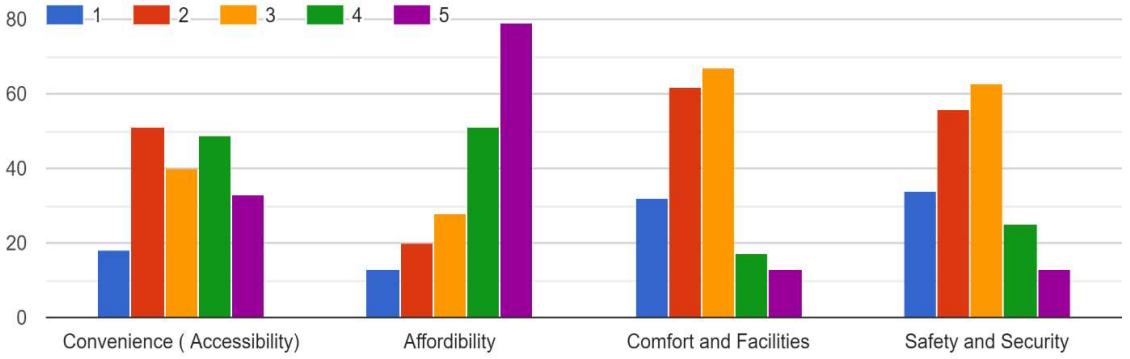
How will you rate Metro? (1= Lowest, 5=Highest) (swipe Right)



How will you rate PMPML? (1= Lowest, 5=Highest) (swipe Right)



MLRM using Excel

- **Multiple linear regression is a regression model that estimates the relationship between a quantitative dependent variable and two or more independent variables using a straight line**
- **The relationship correlation can be such that when one or all independent variables increase/decrease, the dependent variable also increases/decreases.**

Here, we assume that the dependent variable is continuous and normally distributed.

Let,

Y : Willingness of people to switch from PMPML to metro

X1: Convenience (Accessibility)

X2: Affordability

X3: Comfort and Facilities

X4: Safety and Security

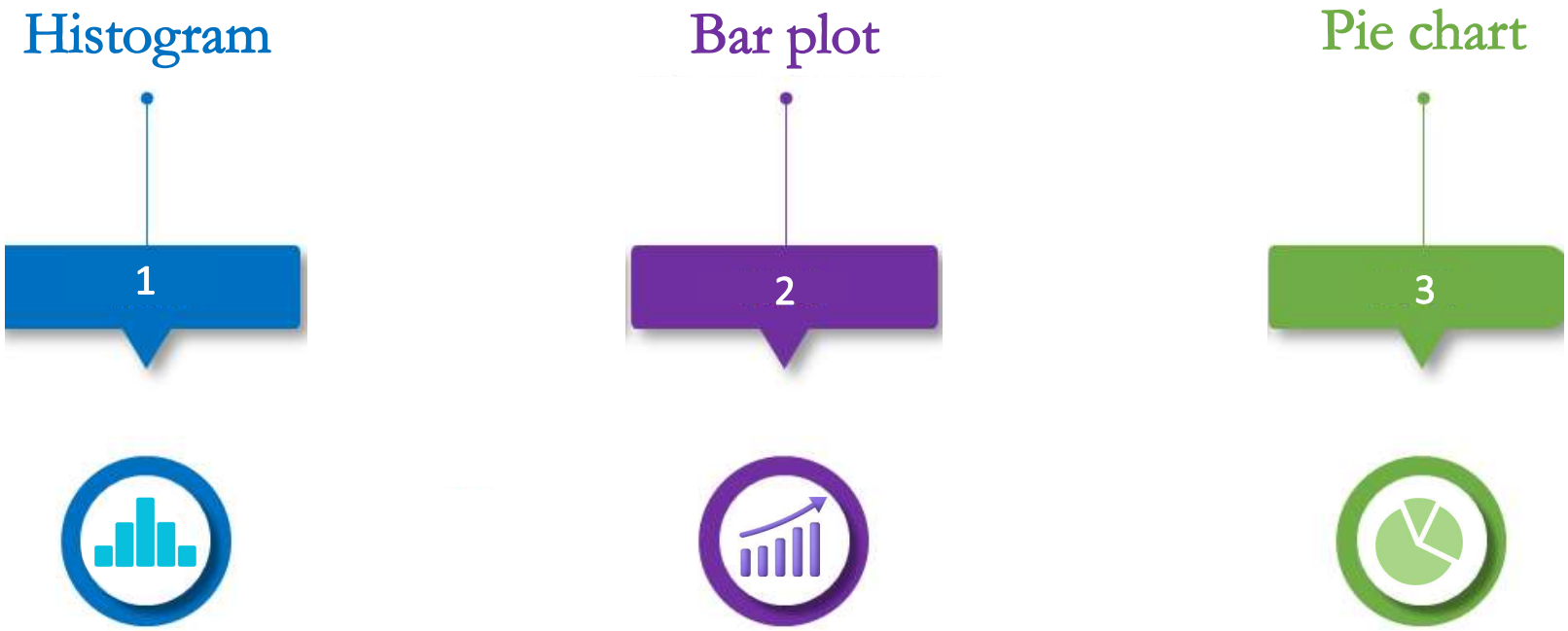
X5: Time required to reach workplace

SUMMARY OUTPUT		
Multiple R	0.386438987	(% of variability Y of explained by X1, X2, X3 X4,X5)
R Square	0.14933509	
Adjusted R Square	0.126219196	
Standard Error	0.777835534	
Observations	190	

Willingness of people

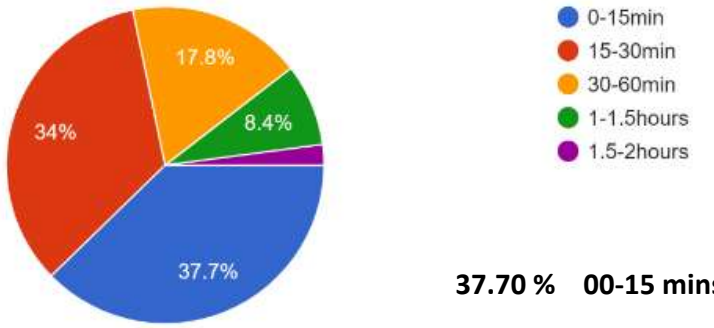
$$Y = 0.906189 + 0.17878*X1 - 0.021937*X2 + 0.022035*X3 + 0.059943*X4 + 0.010696*X5$$

GRAPHICAL REPRESENTATION



Exploratory Data Analysis

Current Time Required to reach your workplace



37.70 % 00-15 mins

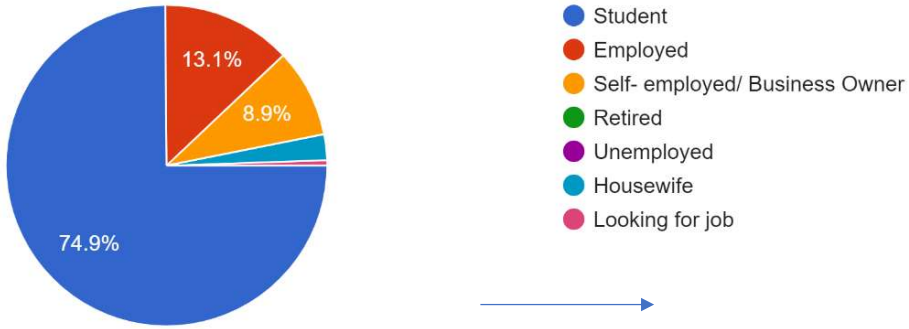
34.00 % 15-30 mins

17.80 % 30-60 mins

08.45 % 1-1.5 hours

02.10 % 1.5-2hours

What is your current Employment Status ?



74.90 % Student

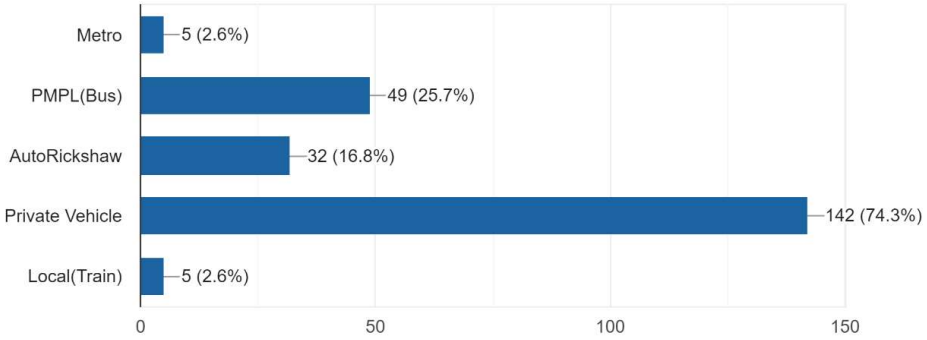
13.10 % Employed

08.90 % Self-Employed/Business Owner

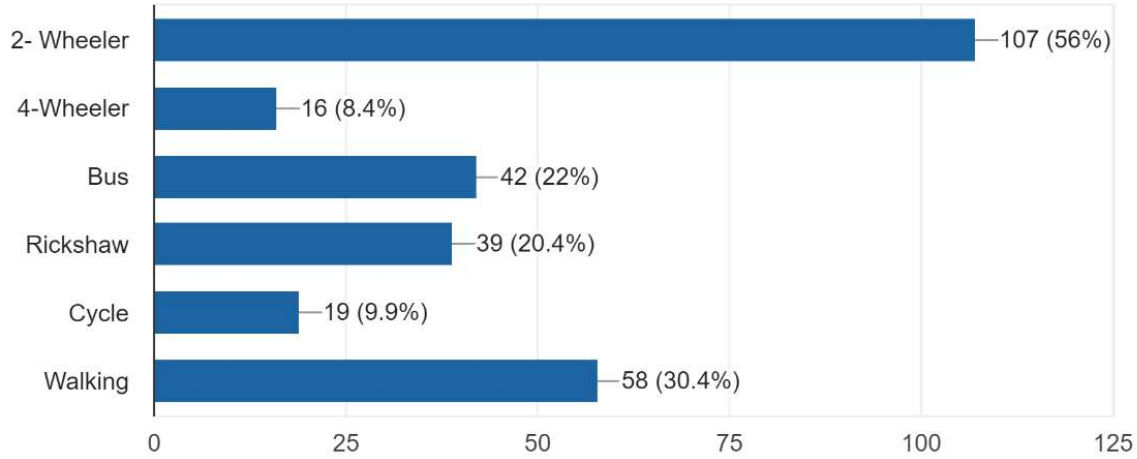
02.60 % Housewife

00.50 % Looking for Joy

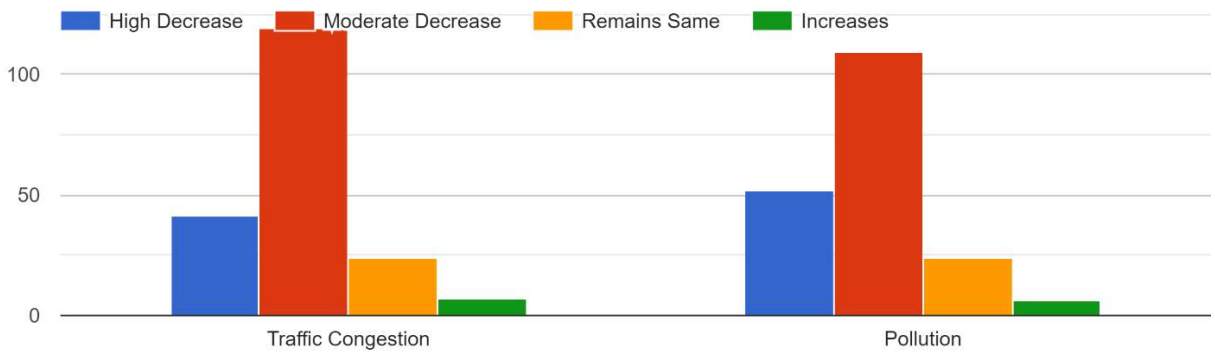
Current mode of Transport to Work



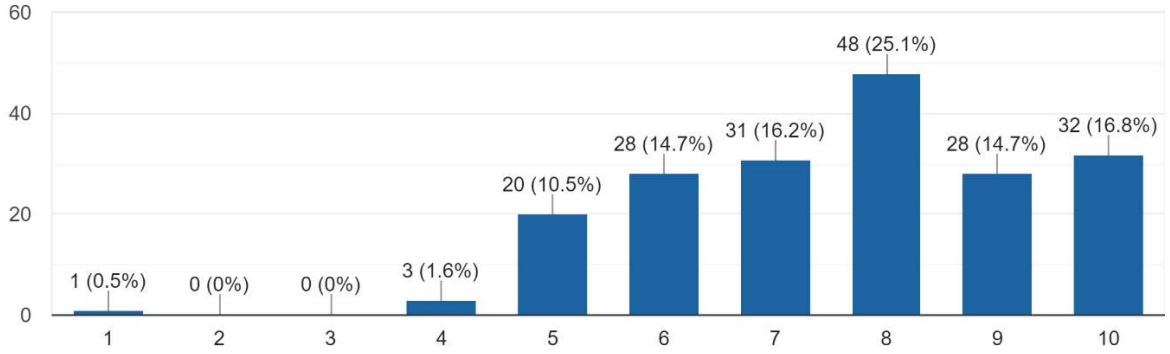
Which available transport service do you prefer to use from your current residence to your nearest metro station?



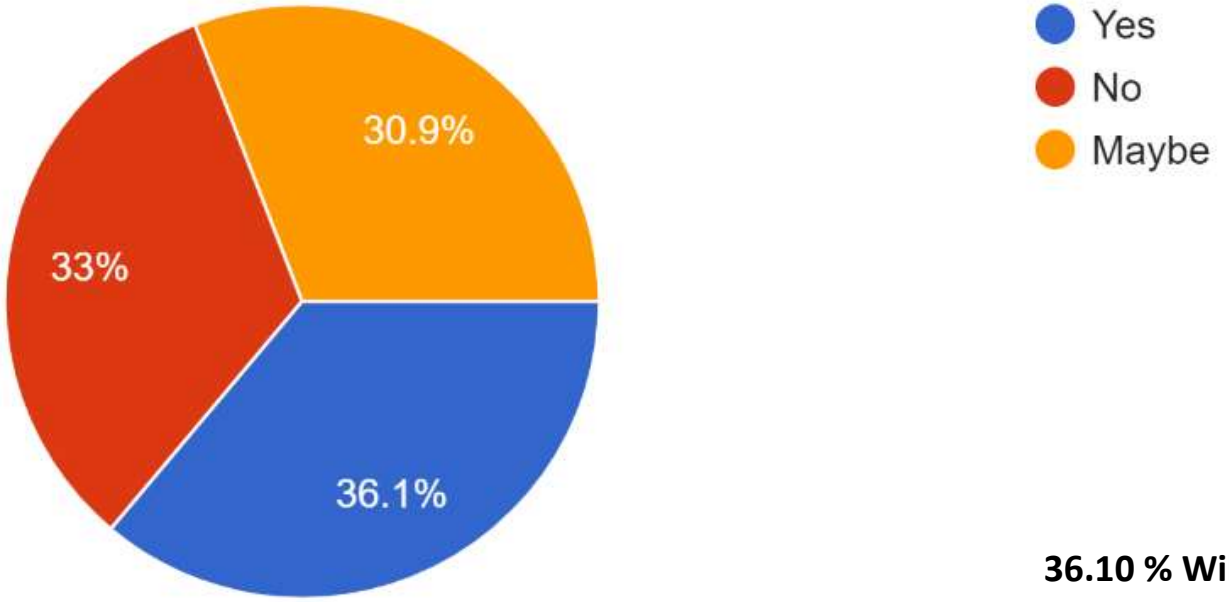
How do you think Metro will effect the following?



How much you rate Pune Metro in terms of Accessibility, Affordability and Time efficiency?



Are you willing to switch to Metro?



36.10 % Willing to switch

33.00 % Not willing to switch

30.90 % May be

DATA ANALYSIS
secondary

Mann Whitney U test

This test is used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed.

Here, we study the relation between the time required to travel from location A to location B by PMPML and by Pune Metro.

Let ,

PTime: Time required by PMPML to cover a distance of A to B

MTime: Time required by Metro to cover a distance of A to B

W=256, p-value=1.43e-06 = 0

Decision Rule: if P-value<level of significance, then reject H0 at 5%l.o.s

Level of significance (a) = 0.05

Decision : Here, P-value < 0.05, we reject H0 at 5% l.o.s.

Conclusion : There is significant difference between the time required to travel from location A to location B by PMPML and by Pune Metro.

CONCLUSION

For Primary Data:

1) Willingness to switch to metro and Employment Status are independent of each other.
2) Willingness to switch to metro and Effect of Metro on travel time are dependent.
3) Here ,we conclude that according to Punekar's perspective:
    - Pune metro is better than PMPML in the terms of Safety Security and Comfort Facilities.
    - While PMPML is better than Pune Metro in the terms of Accessibility and Affordability
4) From Google Form of 190 Observations we conclude that,

- Travel time for 45.5% of population will remain the same, for 35.1% of population the travel time reduces, and for 19.45% travel time increases
- Of the population 36.1% are willing to switch to Metro, 33% are not willing to switch to Metro, 30.9% may be willing to switch
- Of the population, 56.5% have no metro station near current residence, 23.6% have metro station near current residence and 19.9% have metro station under construction
- Of the population, 39.8% have metro station within 3 kilometers of their residence, 28.8% have metro station within 3 to 5 kilometers of their residence and 31.4% have metro station at distance more than 5 kilometers of their residence
- Of the population, 75.9 % will use Metro on daily basis and 24.1% will use Metro occasionally
- Of the population, 43.5% will use UPI payments as mode of payment, 28.3% will use cash payments as mode of payment, 28.3% will use Smart Card (Metro Pass) payments as mode of payment.
- Of the population, 88.5% of the taxpayers think Pune Metro is essential, 11.5% taxpayers think, Pune Metro is not essential.
- Of the population, 96.3% think that Metro will give positive boost towards urbanization, 3.7% think that Metro will not give positive boost towards urbanization.
- Of the population, 43.5% have travelled by Metro, 56.5% have not travelled by Metro.

CONCLUSION

For Secondary Data:

Here, we conclude that The time required for Pune Metro is very less than that required for PMPML to travel from the same Locations A to Location B.

OUR TEAM

01. Ishwari Limaye (9182)

02. Prathmesh Bankar (9101)

03. Kevin Moses (9117)

04. Chaitrali Satte (9141)

05. Tanmay Kshirsagar (9113)

06. Kunal Liman (9160)

THANK YOU