Thakur Educational Trust's (Regd.)
Thakur College of Science & Commerce
UGC Recognised • Affiliated to University Of Mumbai
(NAAC Accredited with Grade "A" [3rd Cycle] & ISO 9001:2015 Certified)

PROJECT REPORT ON:

"Sustainable Urban Transportation In India"

SUBMITTED BY:

ADITYA JITENDRA THAKUR

TY ACCOUNTING AND FINANCE(SEM-6)

SUBMITTED TO:

University of Mumbai

PROJECT GUIDE: HARSHADA MHATRE

ACADEMIC YEAR 2019-2020

Thakur Educational Trust's (Regd.)
Thakur College of Science & Commerce
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DECLARATION

I Aditya Thakur FROM THAKUR COLLEGE OF SCIENCE AND COMMERCE STUDENT OF T.Y.BAF (ACCOUNTING AND FINANCE) SEM 6 HEREBY SUBMIT MY PROJECT ON

"Sustainable Urban Transportation In India"

I ALSO DECLARE THAT THIS PROJECT WHICH IS PARTIAL FULLFILLMENT FOR THE DEGREE **T.Y. BCOM (ACCOUNTING AND FINANCE)** OFFERED **BY UNIVERSITY OF MUMBAI** IS THE RESULT OF MY OWN EFFORTS WITH THE HELP OF EXPERTS

Aditya Thakur

Date:

Place:

Thakur Educational Trust's (Regd.)
Thakur College of Science & Commerce
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CERTIFICATE

THIS IS TO CERTIFY THE PROJECT ENTITLED IS SUCCESSFULLY DONE BY **Aditya Thakur** DURING THE THIRD YEAR SIXTH SEMESTER FROM **THAKUR COLLEGE OF SCIENCE AND COMMERCE** KANDIVALI (EAST)

MUMBAI:400101

COORDINATOR PROJECT GUIDE PRINCIPAL

INTERNAL EXAMINER

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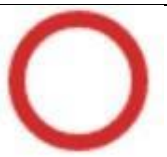 **17.5% Plagiarised**	 **82.5% Unique**

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To list who all helped me is difficult because they are so numerous and the depth is so enormous.

I would like to acknowledge the following as being idealistic channel and fresh dimension in the completion of this project.

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I would like to thank my college library, for having provided various reference books and magazines related to my project.

Lastly, I would like to thank each and every person who directly or indirectly helped me in the completion of the project, especially my parents and my peers who supported me throughout my project.

Aditya Thakur,
Place: Mumbai

Date: 15- 12—20 1

TYBAF SEM VI project work (Gantt Chart) / Time line for project completion

Name of the Student = Aditya Thakur class/div=TYBAF C Roll No.=8539 mob.no.=7738118584

Task ID	Task Description	Task Duration in days	Start Date	End Date	03-Feb-20	05-Feb-20	08-Feb-20	10-Feb-20	13-Feb-20	17-Feb-20	20-Feb-20	24-Feb-20	02-Mar-20
1	Chapter No. 1: Introduction												
2	Chapter No. 2: Research Methodology												
3	Chapter No. 3: Literature Review												
4	Chapter No. 4: Data Analysis, Interpretation and Presentation												
5	Chapter No. 5: Conclusions and Suggestions												
6	Bibliography, Appendix												
7	First Draft												
8	Second Draft												
9	Final Draft												

important:

1. Referencing style APA 6th
2. The Project Report shall be bounded
3. The project report should be 80 to 100 pages
4. Gantt chart shall be filled by faculties only
5. The final draft shall be signed by guiding teacher
6. The faculties are allowed to link the tasks in gantt chart
7. Be sure to display start and end dates for each task
8. Account for time off, holidays and internal exams
9. To define the critical path, use lines to connect a task

Project Guide=
Department =

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CHAPTER.1

1.1 INTRODUCTION.

In the new age of urbanization it is very important for any developing economy to have an efficiently working and flexible transportation system.

A human body can function properly only if all the nerves, arteries and veins all are perfectly functional. Just like that the functioning of the Indian economy which here can be compared to the human body can only function properly when this connection between the human veins and arteries is applied to our own nation's transportation system.

In this research paper I will like to shed some light upon our transportation system, how we can develop it, which are the main areas for improvement, how can we build a better and sustainable future with the development of transport.

This project is divided into various sections which will help us to reach on a conclusion whether the sustainable urban transportation is actually possible in a country like India.

If yes then how much time will it take us to reach our desired goal. If no then how can we strive towards better development of our essential economic variable transportation.

The area that I'm trying to focus is on some of the modes of transportation in our day to day lives, as these are the modes that are used the most by the people. The main cities that are focused here are mainly the developing and important cities for our Indian economy as we are still in a developing phase it is better for us to strengthen what we already have and increase the efficiency of the rural areas as the process continues.

First of all what is sustainable development, what are its merits, demerits, etc will be discussed.

Later the various ways in which the project will be taken forward will be discussed by the focus on-

1. INDIAN ROAD TRANSPORT
2. INDIAN AUTO RIKSHAS
3. INSIAN BUSSES
4. INDIAN RAILWAY SYSTEM.

1.2. WHAT IS SUSTAINABLE DEVELOPMENT.

Sustainable development means the development that happens over a gradual period of time.

Sustainable development takes place when the natural resources of any economy depletes and even though the country strives and acknowledges the shortcomings and work on them in order to develop.

1.3. IMPORTANCE.

- It works as a benchmark for development and success in any nation's economy.
- Free flow and congestion free travelling leads to happy citizens.
- Economic boost in the global markets.
- Increased connectivity and flexibility in operations.
- Reduction in cost of production.
- Reduction in Scarcity.
- Specialization in labour and Mobilization of Resources.

1.4. INTRODUCTION TO TRANSPORTATION INDIA.

In India transportation is widespread and is one of the most heavily transport savvy country of the world.

Indian transport is heavily driven by road transportation, next comes railways.

India has always been a prey on the lack of planning as many cities, towns, villages and even states are not planned properly which led to the state of transport that we are facing today.

There has been a severe increase in the number of private vehicles purchased in last 5 to 10 years and is suspected to grow even further as time progresses.

In the metropolitan city of India, here in Mumbai how the increase in number of vehicles affect any given region's transport can be seen with crystal clear precision.

1.5. OBJECTIVES OF THIS STUDY.

- To find out what does the youth think about the condition of the transport that is present in India today.
- To arrive at a conclusion whether the sustainable can development take place or not.

- To spread awareness about the condition of transportation in our country.
- To study and analyze the progress made by Indian transportation development organizations in adopting new technology.
- To identify various programs initiated by the government regarding sustainable development of transportation in Indian economy.

1.6. NEED FOR SUSTAINABLE TRANSPORT

India, one of the fastest growing economies in the world, is achieving a growth rate of 7.5% per annum. With a growing population too, the country is working hard to transform itself over the next few decades

Individual cities cannot afford to cater only to private cars and two-wheelers. There must be a general recognition that without public transport cities would be even less viable. There is a need to encourage public transport instead of personal vehicles is requires both an increase in quantity as well as quality of public transport and effective use of demand as well as supply-side management measures. People should also be encouraged to use nonmotorized transport and investments may be made to make it safer. The cities are the major contributors to a better economic state of a country and hence there is a need for better interconnectedness and better movement opportunities is of paramount importance for living a better quality life.

The growth of vehicles has been much faster than that of the population. The number of registered vehicles increased from 55 million in 2001 to 142 million by 2011, with a currently-estimated 195.6 million in 2016.

1.7. DEMERITS OF HAVING NO PROPER TRANSPORTATIONAL AWARENESS.

1. CONGESTION:

The rapid growth in private-vehicle ownership has led to increased congestion problems in cities. The average speed of a vehicle on Indian roads is just 17-19km/h between 9:00 and 21:00, with the slowest times witnessed during the evening hours. The average speed of traffic in key Indian cities is just 17-23km/h while the average cycling speed is 15-16kmph

2. ROAD ACCIDENTS:

You can say that the road accidents can be by products of recluse driving and the point that was discussed above which was of Congestion problems. India recorded a total of 501,423 road accidents and 146,133 road accident deaths in 2015; this

equates to 1,374 accidents and 400 deaths on India's roads every day. Sadly, 54.1% of people killed in road accidents are in the 15-34 years age group. It is estimated that the economy lost around 3% of GDP (1999-2000) due to road mishaps.

3. AIR POLLUTION:

One of the most famous and basic demerit of unmanaged transportation is the problem of pollution. Global warming is real and the temperatures are increasing day by day the climatic conditions are unusual and is having an affect on the whole World.

In the Global Burden of Disease 2010 (GBD) study, 'outdoor air' pollution is among the top 10 risks worldwide and the top six risks in the developing countries of Asia. Air pollution has greater impact on developing countries such as India, as 1.4 million people lost their life due to air pollution; US$ 505 billion towards welfare losses; and US$ 55.4 billion towards lost labour.

4. DECLINING SHARE OF PUBLIC TRANSPORT:

The share of public transport is decreasing in India. The federal government has recently published the results of the mode of transport people take to commute to work for the latest Census 2011 data in March 2016, According to the survey more than 50% of the workforce (excluding domestic and agriculture) continue to work at home or travel to their workplace by foot in the absence of adequate transport facilities. Citizens are largely dependent on private transport. The share of public transport is just 18.1% of work trips.

1.8. FEATURES AND MERITS OF A DEVELOPED URBAN TRANSPORTATION SYSTEM.

1. PROPER FLOW OF TRAFFIC:

When the transportation is well developed the flow of traffic in the country is free and flexible, Japan is a great example for free flow and flexible transportation as the roads are pre planned which helps in efficient transport of goods as well as people.

2. LESS ACCIDENTS:

Accidents are of two types first of human fault and second of the fault in governance even though the former outweighs the latter in India due to the less abiding masses of India it will be a feature that a country with sustainable transportation system will have a fatality ratio far lower than many other countries the fatality cannot be zero as human mistakes and behaviour both are subjective to every individual person living in any society.

3. INNOVATIVE TECHNOLOGY:

IT solutions are very important for the growth of the economy as a whole and hence any developed economy which has a developed transportation system has innovative technology that can be later exported and first used to increase their own GDP.

A great example is the making of the bullet trains in Japan and the making of METRO in India. These are the steps that a nation can take in order to increase the level of technology that it has its hands upon and increase the growth of the economy accordingly.

4. TRADE BENEFITS:

A developed sustainable transporting system will always reap heavy trade benefits as the TIME required to transfer goods and services is reduced and also the AMOUNT of goods can also be increased as there are many moments where due to the quality of the transportation system many traders suffer losses due to the condition of the roads, accidents, time delays and etc.

1.9. RESEARCH METHODOLOGY.

Methodology is an important part of research to find conclusions to research objectives that are more than the same. Therefore it figures as one of the most important part of any study. This chapter focuses on the design and method that has been utilized in order to conduct this study. In addition the procedure that has been followed to collect, accrue, process and analyze the data is presented. The research approach used in the study is presented below.

TYPE OF RESEARCH

There are various classifications of methods that are used in the study but these are not sharply distinguished from each other. The present study is exploratory in nature and provides a clear guidance for conducting this specified research.

A study related to pertinent books and articles along with clues which further help to evaluate and understand the information and formulate an accepting and workable hypothesis.

The research is also representing descriptive research where focus is mainly on fact-finding investigation with adequate interpretations. It is designed to gather information for formulating studies that are more sophisticated.

Data is collected through survey method, for formulating an acceptable and workable hypothesis and interpreting relationships analytical study is utilized. Thus the study makes use of the quantitative research method approach.

Quantitative approach is chosen by the researcher because it enables him to understand the variables more clearly and identify any discrepencies and differences that may be present in the variables that are studies by him.

RESEARCH METHODOLOGY

SAMPLE UNIT: INDIAN CITIZEN

SAMPLE SIZE: 100 RESPONDENTS

SOURCE OF DATA:

THE PRESENT DATA WAS COLLECTED THROUGH PRIMARY, SECONDARY AND QUESTIONNAIRE METHOD.

SAMPLE SIZE:

USING CONVINIENT SAMPLING A SAMPLE SIZE OF 100 INDIAN CITIZENS IS TAKEN INTO CONSIDERATION.

DATA COLLECTION:

THE DATA IS COLLECTED USING QUESTIONNAIRE. THE QUESTIONS INCLUDED ARE RELATED TO THE OBJECTIVES. BOTH CLOSE ENDED AND OPEN ENDED QUESTIONS ARE ASKED TO GET ANSWERS OF THE OBJECTIVES LAID DOWN IN THE STUDY.

DATA ANALYSIS:

THE ACCULATION OF THE STATISTICAL TOOLS AND TECHNIQUES FOR THE DATA COLLECTED BY THE MEANS OF QUESTIONNAIRE METHOD HAS BEEN CLASSIFIED, TABULATED, ANNALYZED AND SUMMARIZED WITH THE HELP OF STATISTICAL TOOL PERCENTAGE

CHAPTER 2.

REVIEW OF LITERATURE.

A number of past researches have been conducted and published on this topic of urban sustainable transportation in India. Due to the shortage of time and resources the full fledged study of all the researches that had been conducted cannot be fullfilled and hence to cope with that a summary of some of the snap shots of some researches that have been conducted by Different individuals have been mentioned in this project. Some of them are as follows:

1. EMBRAQ INDIA:

This research was conducted by the project manager of urban transport in EMBRAQ INDIA MR. AKSHAY MANI, the Director MR.MADHAV PAI and the Associate Institutional Relation Manager MR. RISHI AGGRAWAL. This is a very deep and conclusive report on the development of Indian transportation in various cities. The main focus in this project was on the Industry of Auto-Rikshaws that are present in various cities. As they are one of the most used and popular mode of transport in India. The study dives deep into the relation between the problems faced by the Indian transportaiton system today and the number and types of Auto-Rikshaws in various parts of India.

The fundamentals of the research were the state governing bodies the information provided by them that was made public has helped a lot of people in their researches. The conclusion of their study is that a reform is needed in the Auto-Rikshaw sector by division of the sector into Carriage related and non-carriage related functions.

JASPAL SINGH(2016):

MR.JASPAL SINGH is the Head of UTIP INDIA office and he has presented his research on the Public Transportation In India. Public transport is the sector where in which if the development of sustainable transportation needs to happen needs to be developed first and is of utmost importance. The research is heavily data driven and utilizes all the data that was available from the nations transportation diary's. The main points that are recorded in this research is that in India the number of all the private vehicles are growing day after day and this is very serious issue which if not tackled at the earliest will lead to further problems on a national level. Various solutions are also presented in the research by the way of smart cities and Infrastructural Development. This research is purely focused on the Public transportation aspect.

The UITP is nation wide Non Profit Organization that helps the government by providing various ideas about the renewable sources of energy and other ways in which sustainable development can be reached in the transportation sector of the Indian economy. The research by MR. JASPAL SINGH highlights the same factors and is a helpful source of information for future generations

2. **PUBLIC TRANSPORT TRENDS (UITP 2015):**

The Public Transport Trends report shows just how much public transport will need to change, both from the inside and in relation to the external trends affecting its socio-economic environment.

This research has laid its foundation upon the various ways in which our country can fair better in the global market with other countries by increasing the amount of smart

technologies that will help us achieve that goal of self betterment and sustainable development in urban transportation.

As the worldwide centre of knowledge and expertise for public transport, UITP will take full ownership of those trends and hot topics. They will shape the Association's work programme for the next two years.

Funding public transport, search alternative sin ways of Smart fares and use of smart technology is all the presented conclusion foe the objectives that was laid down in the study.

The objectives mainly were how can we increase funding in the public transport unit, how can we benefit from the cultivation of smart technology, how to reduce the consumption of fossil fuels and limitation and annihilation of the increasing output of greenhouse gasses from traditional transportation technology.

3. INDIAN INSTITUTE OF MANAGEMENT (2006):

This was a review or a research that was conducted by a professor at the Indian Institute Of Management Studies, Lucknow. The research was done by Sanjay Kumar Singh and it is based on various number of factors that either determine or undermine the development of urban transportation in India.

The Research is very factual as on the basis of the information that has been provided in it. It sheds light upon a lot of factors that may have been previously unknown by any individual.

The objectives of the research were clear and simple that it was to 'find out the reason behind the lacking Indian transportation'.

Mr. Sanjay has well presented various facts and figures in his research that I too find useful for quantifying my research findings. Many stats such as the number of registered motor vehicles present at the time, the number of road accidents taking place, the emissions of the greenhouse gasses in various cities etc have been carefully quantified and applied.

The conclusion that was derived was that the citizens should engage in more physical activities b y walking and cycling as these were some of the best bets that they could

come up with as the data that was presented was based on 2002 findings. But overall it is a great insight to have on a India that was in 2002 and now in 2018.

THESE WERE SOME OF THE EARLIER RESEARCHES THAT WERE CONDUCTED AND MY POINT OF VIEW FROM THEM THAT HAVE BEEN PRESENTED EACH PROJECT WAS FULLFILED WITH HARDWORK AND DETERMINATION AND EACH HAD A GREAT WORKABLE CONCLUSION THAT CAN BE FOLLOWED.

CHAPTER 3.

SUSTAINABLE URBAN TRANSPORTATION

1. WHAT IS URBANIZATION?

Urbanization refers to the population shift from rural areas to urban areas, this gradual increase in the proportion of people living in urban areas, and the ways in which each society adapts to this change leads to urbanization.

1.1 URBANIZATION IN CITIES

Urbanization in the field of transportation is of unprecedented importance influencing the mobility of individual citizens of India. There has been a great increase in the number of citizens in urban areas in the past few years by a significant amount.

In 1951, there were only five Indian cities with a population greater than one million and 42 cities with a population greater than 0.1 million, much of India effectively lived in villages. In 2011, there were 468 cities with population above 0.1 million and 53 cities with population greater than 1 million

Cities as per population	No. of cities
>10 million	**3**
5-10 million	**5**
2-5 million	**10**
1-2 million	**35**
Total cities with more than 1 million population	**53**
0.5-1 million	**43**
1-0.5 million	**372**
Total number of cities	**468**

Table 1: Number of cities as per population; Population figures as per 2011 census

From 2001 to 2011 the number of people living in urban cities jumped from 268 million to 377 million this sudden yet great shift is the reason to consider that the urban yet sustainable modes of transportation needs to be established as soon as possible.

1.2 RAPID MOTORIZATION.

Since 2001, the number of vehicles per 1,000 people in Indian metropolitan cities have grown significantly. The total registered vehicles in this country increased by a CAGR(Compounded Annual Growth Rate) of nearly 9.8 % between 1991 and 2009.

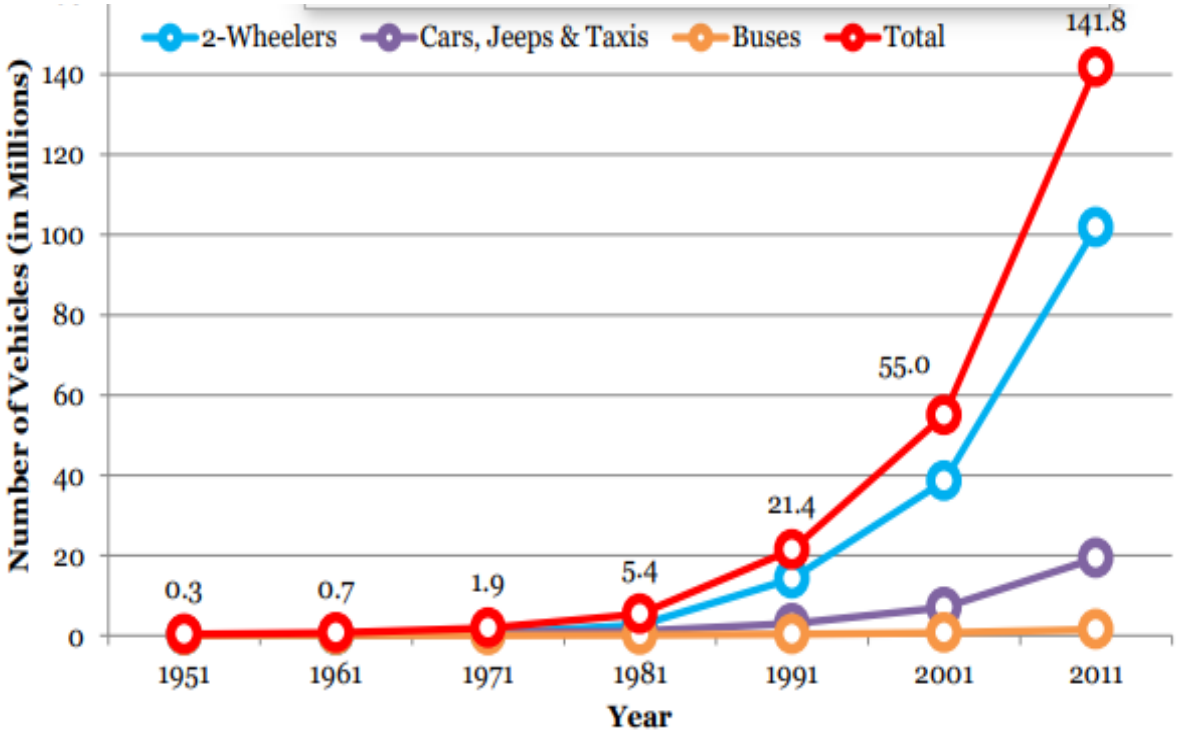


Figure 1: Growth of registered vehicles in India in Millions

Personalised private vehicles like cars and two-wheelers increased at CAGR of 9.6 per cent and 10.3 per cent per annum. The growth of these registered vehicles in cities with population more than a million is significantly higher than the rest of India which is a striking concerning matter.

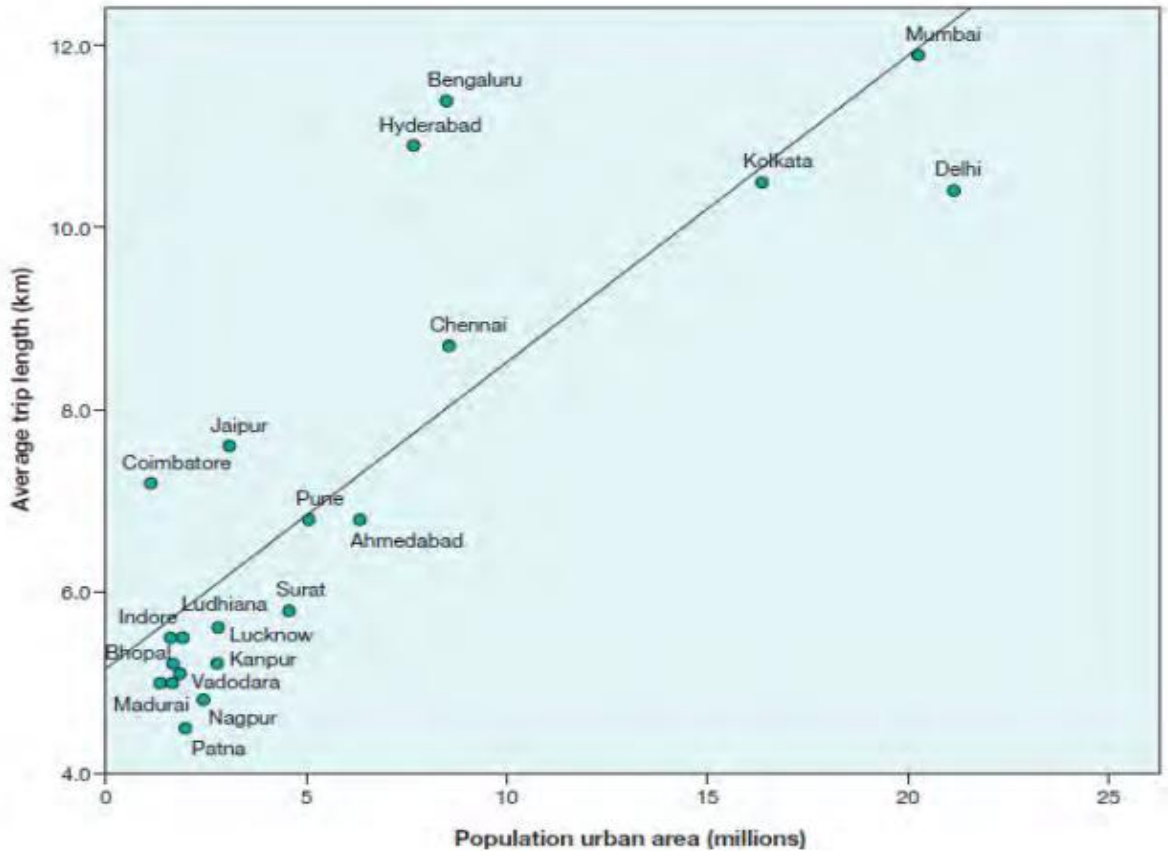
Personalised private vehicles that were present at the time like cars and two-wheelers grew at CAGR of 9.6 per cent and 10.3 per cent per annum. This growth of registered vehicles in cities with population more than a million is significantly higher than the rest of India that can be seen from the graph given above.

The combined effect of both the factors that have been mentioned above namely **RAPID URBANIZATION** and **RAPID MOTORIZATION** is the reason for concern regarding sustainable urban transportation development

2.URBAN TRANSPORTATION PROBLEMS

A) ROAD CONGESTION

FIGURE 2:



THE ABOVE FIGURE SHOWS AVERAGE TIME TO TRAVEL IN CITIES IN CONTRAST TO POPULATION.

As populations increases, the average travel distances as well as intensity are expected to increase as there is a direct correlation between the two indicators (See Figure 3). Average trips lengths for metro cities including Bengaluru are over 8 km, while it is 6 km or less for all other metro cities. This trend in trip length and frequency is only expected to increase with increasing income levels, migration, participation of women and a service-oriented economy. As more people travel over longer distances on regular basis for employment and education purposes, will inevitably lead to road congestion.

B) PARKING PROBLEMS

Parking problems come into being as the population density from previous figures we can see that are keeping on a steady increase and are in no planning to be stopped or decrease in any point soon. The latest studies reveal that the acute problem of parking is faced by indians due

to the tendency of the indian citizens to park on streets, on street parking is on of the major causses for road congestions in India.

In Delhi, the public parking charges are fixed as low as Rs10 for 8 hours during the daytime, these charges are variable in nature and are different in different cities for eg. In Kolkata the parking charges are Rs 80 for eight hours and different for different areas like commercial zones, school zones, industrial zones etc.

C) AIR POLLUTION

The severity of air pollution in Indian cities is judged based on CPCB's (Central Pollution Control Board) air quality classification. According to their available air quality data of 180 Indian cities, there is a wide variation in the pollution concentration and severity across cities. Cities are considered critically polluted if the levels of criteria pollutants (namely PM10 and NO2) are more than 1.5 times the standard. Results show that half of the residential areas in cities monitored by CPCB are at critical levels of air pollution.

Such levels of pollution is important to be controlled and reduced. According to the US health issues department the people living 500 meters near the areas where the amount of fume emission is more in the diesel driven vehicles and can cause many respiratory disorders if certain type of care and containment is not made.

Air pollution in Indian cities is the fifth leading cause of death in India. Annually, about 620,000 premature deaths occur due to air pollution in Indian cities The Environment Pollution Control Authority (EPCA) report for the decade 2002 to 2012 shows that the number of vehicles increased by 97 per cent, contributing enormously to pollution and direct exposure to vehicular toxic fumes to nearly 55 per cent of Delhi's 17 million people who live within 500 meters from any road side.

D) DETERIORATING ROAD SAFETY

The high dependence of people who are on the streets on non-motorised transport modes such as walking and cycling causes a mix in traffic modes in common roads where fast-moving motorised traffic shares the roads with slow-moving modes leading to an increasing number of fatalities and road accidents.

This was the observation that was made by the World Health Organization, 2013. Indian cities however the non-motor using population of India like the cyclists and pedastrians still use the

same way as the 4 wheeler vehicles and 2 wheeler vehicles which does not ensure safety but threatens it and is one of the major causes of road accidents that happen in India, this was a conclusion drawn from the study that was conducted by National Urban Transport Policy (NUTP) in 2008.

Pedestrian fatalities constitute a major and defining share of total fatalities and the magnitude is in fact much higher in cities that lack adequate pedestrian facilities. In New Delhi, Bengaluru and Kolkata, the pedestrian fatality share is greater than 40 per cent.

The percentage of streets with pedestrian pathways is hardly 30 per cent in most Indian cities. The main reason behind this is inequitable distribution of road space and the fact that streets in India are not designed with the intention of accommodating all the functions of a street.

3. POLICY RESPONSES TO TRANSPORT ISSUES

The government of India has appointed many ways and measures to tackle the problem of Urban Transportation that were said in detail above. Most large cities are able to make decisions and implement them at the local level just like the other developing countries around the world.

The Indian government has put up many reforms that have aided the transformation of the economy from normal method of transportation to more urban and sustainable way of urban transportation.

Central monitoring and supervision is limited at the local level where planning and policy is carried out. This type of planning and execution is necessary for the betterment of the economy and reach the goal of sustainable urban transportation.

The foloowing subsections are the overview of the plans that the Indian government has taken up to enhance the living conditions by urban transportation. These policies are namely:

a. PLANNING COMMISION
b. NATIONAL URBAN TRANSPORT POLICY (NUTP)
c. JAWAHARLAL NEHRU NATIONAL URBAN RENEWAL MISSION (JNNURM)

PLANNING COMMISION

Urban transportation and urbanization was a field that was not acknowledged before much but in the new india plan it gained a significant boost, until the NUTP in 2006. The plan documents, from the First Five-Year Plan onwards, laid stress on intercity transportation of different modes and created rail, road and air infrastructure to meet the demand. Since the Sixth Five-Year Plan, the Planning Commission had acknowledged the importance of transportation in ensuring 22 CHALLENGES AND RECOMMENDATIONS IIHS RF Paper on Urban Transport in India sustained economic growth and development of various segments of the economy.

But it was only in the eighth five year plan that it was decided that a unified body that is fully indulged in resourcing and the hearing of urban transportation problems from the citizens of India, a separate unifies financial comission that helped the planning comission in carrying out the solution to the problems. These were the changes that were emphasized.

In the Ninth Five-Year Plan, it was realised that the need to develop urban transport institutions and active collaboration between central, state and local governments which was the joining factor between the dream of achieving the goal of sustainable urban transportation. The Tenth Five-year plan was a great leap forward regarding the transit departments of many sates of the Indian subcontinent by introducing many of the financial changes that were made the finances for the development of the

Sustainable urban transportation were increased the main effects were seen in the forms of the metro reforms.

The Eleventh Five-Year Plan proposed improving the productivity of many states in India and also the activities that were performed by them in an integrated manner by changing and developing the capacity and by allocating funds for technological upgrade and modernisation.

Just like these many plans have been made so that the country can come closer to the objective of achieving sustainable urban transportation.

NATIONAL URBAN TRANSPORT POLICY (NUTP)

The central government, under the Ministry of Urban Development (MOUD), issued the National Urban Transport Policy in 2006 with specific policy objectives these objectives were such as achieving safe, affordable, quick, efficient, comfortable, reliable access to jobs, education, clothing, entertainment and recreation and other such needs to all the citizens living in the urban cities as the number of people in urban cities showed a treat number of growth and population that was due to various migrations and other factors that have been discussed before in the research.

The NATIONAL URBAN TRANSPORT POLICY introduces measures to reduce the various problems that were mentioned above such as road congestion, air pollution. It has mentioned four main policies that help to resolve the problems they are namely:

a. Increasing efficiency of road space by favouring public transport.
b. Using traffic management instruments to improve traffic performance.
c. Restraining growth of private vehicular traffic.
d. technological improvements in vehicles and fuels to reduce vehicle emissions.

The NUTP recognized that the states will play one of the most important role in the process of sustainable development and the central government's role was confined to supporting the states with the necessary financial support and technical expertise as the central government pans out to a national level; and the problem related to sustainable development in transportation is related to be solved Micro economically and not Macro economically.

It has been well recognized in the NUTP that a solution to complex urban transport problems lies in the development of an efficient and affordable PT system. The fare issue is not addressed in a comprehensive manner that would allow a full range of options to be considered. The fare options are very basic in nature and hence seem to be out spoken or not considered when comparing the various issues that are generating or had been generating a lot of transport issues in the past.

The NUTP did not propose any specific actions to resolve this issue but indicates provision of implicit subsidies which the operators would have to provide.

JAWAHARLAL NEHRU NATIONAL URBAN RENEWAL MISSION (JNNURM)

The Jawaharlal Nehru National Urban Renewal Mission (JNNURM) was set up in December 2005 by the central government, and 63 cities were identified to be eligible for seeking central funds under this program for urban renewal and reforms in phase one.

The prime reason behind the existence of this scheme was the goal of creating perfectly functional and well to do URBAN LOCAL BODIES (ULB) for the successful planning, organizing and executing of the of the practices that are related to getting rid of the urban transportation problems. Another objective was to address distortions in the urban land markets arising largely out of a plethora of regulations.

In order to take steps further in a wider range of scope JNNURM took on the task for the development of City Development Plans (CDP's). These CDP's would help guide the whole

city level development opportunity to the preferred policy maker and executor of plans, these improvements mainly included to integrate land use and transport planning, and address infrastructure needs in a sustainable manner.

All proposed transport projects are complied with the NUTP guidelines. To give effect to this, the program provided for an outlay of central assistance of more than Rs66,000 crore for the seven-year period, and linked the release of assistance to completion of the reforms.

Currently under this scheme a total of 138 urban transport schemes have been issued under JNNURM and almost 80% of all these projects are taking place in heavily dense and populated cities with the population of each city being more than 4 million in range.

But the JNNURM scheme has not yet lived upto its calibre as there are many flaws that have come up and have significantly affected the name of the scheme to degrade some of these reasons include somethings like, the post analysis of the JNNURM scheme resulted in the lack of urban transport development transport lacked effective monitoring and verification mechanisms, Land use transport integration has not happened, Most of the JNNURM funded projects have seen improvement of the urban infrastructure to facilitate smooth traffic flow in the short term, about 70% of the who,e funding's of the JNNURM were going towards the making of the roads and flyovers and very little towards the urban sustainable transportation policy that were discussed by them demonstrating the inequitable allocation of resources for sustainable transport modes such as NMT and public transport.

Many critcs now argue that there has been little to no development regarding the JNNURM project.

4. VARIOUS URBAN TRANSPORTATION FINDINGS AND IMPORTANCE.

4.1ROLE OF AUTO RIKSHAWS.

Since the introduction of auto-rickshaws in India in the late 1950s, these vehicles have become an indispensable aspect of urban mobility for millions of people. Auto rickshaws play a vital and vibrant role in India's urban transport systems. Yet they also represent a very improvisational and increasingly inefficient sector – and they are getting lost in the changing dynamics of urban mobility in India.

Today, with increasing urban populations, there is growth in demand for urban transport, growth in private motorization and a decline in public transport share. How do auto rickshaws fit in and have a role that is efficient – for both the operators and their passengers? And how can these three-wheeled wonders contribute to urban transport sustainability – through both reductions in emissions and safety for everyone on the roads?

These auto rikshaws sector have a great play in the urban transport sustainability and thus it is important to have all the perceptions of the auto rikshaw sector by all the negative perceptions of the auto rikshaws and also the new models and reforms that may help in the making of a better mode for urban transportation and sustainable development. A better and optimal resource for a safer system and play an important role in this transportation mix.

DEMAND OF THE AUTO-RIKSHAW

As the demand for urban transport increases in India, so too does the popularity of the autorickshaw. Production of this type of motorized three-wheeler has doubled between 2003 and 2010. In major cities the auto-rikshaw sector is very important and is responsible for the significant number of motorized trips that take place in any metro-politian city. Any study or any report that is conducted or any government policy that may involve matters regarding the development in sustainable urban transportation must hence include this important transportation sector.

The Avoid-Shift-Improve (ASI) framework, one of the key approaches to promote sustainable urban transport. The ASI scheme is based on 3 terms:

(1) Avoid unnecessary trips.

(2) Shift to more sustainable transport modes.

(3) Improve performance in all modes.

ROLE OF AUTO-RIKSHAW IN PROMOTING SUSTAINABLE URBAN TRANSPORT.

Auto-rickshaw services in cities can help meet the objectives of the Shift strategy—of promoting public transport and reducing private motorization—based on the following aspects:

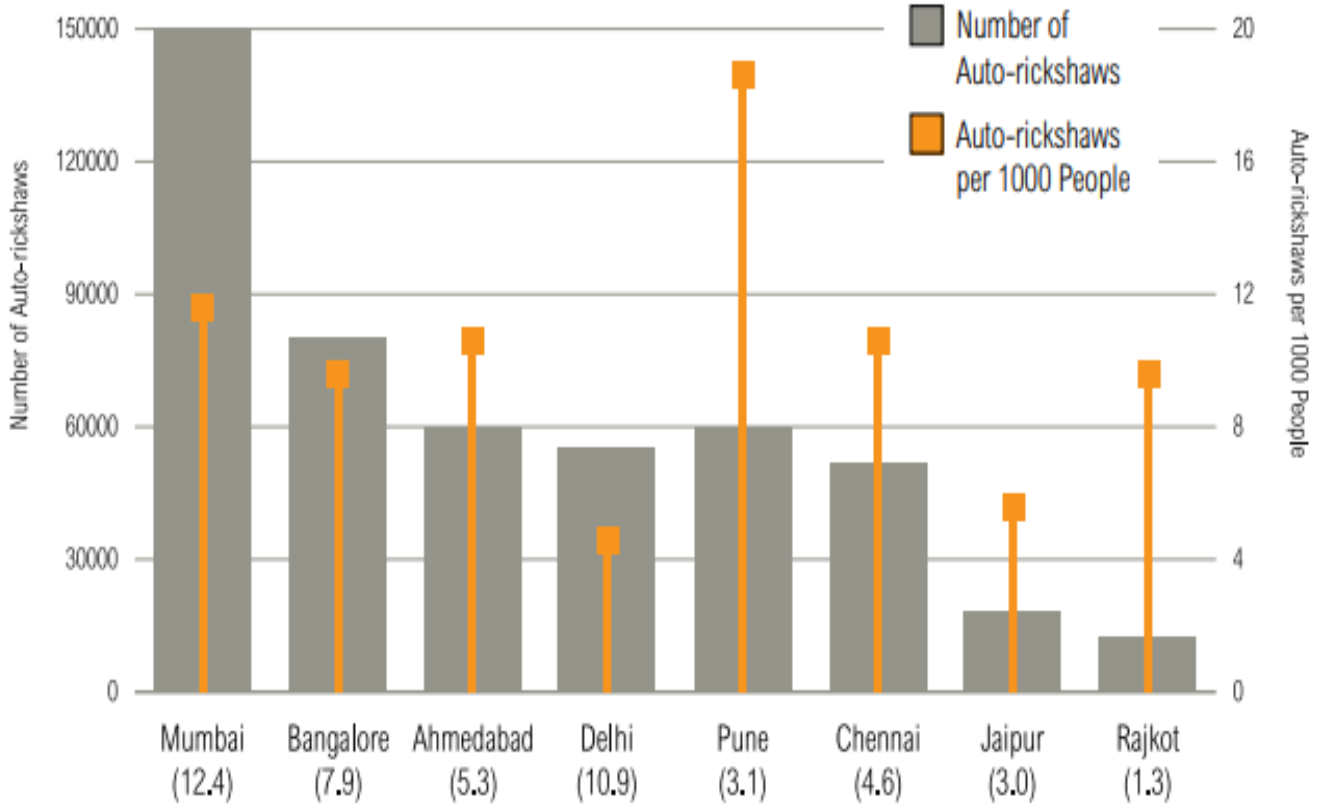
FIRST AND LAST MILE CONNECTIVITY TO PUBLIC TRANSPORT:

Auto-rikshaw is considered as the feeder mode of transport as the easy accessibility helps the transportation problems resolution a lot. Integrated as a feeder mode providing such connectivity, can complement public transport systems by ensuring that all parts of the city have easy access to public transport stations.

DOOR TO DOOR TRANSPORT ALTERNATIVE TO PRIVATE TRANSPORT:

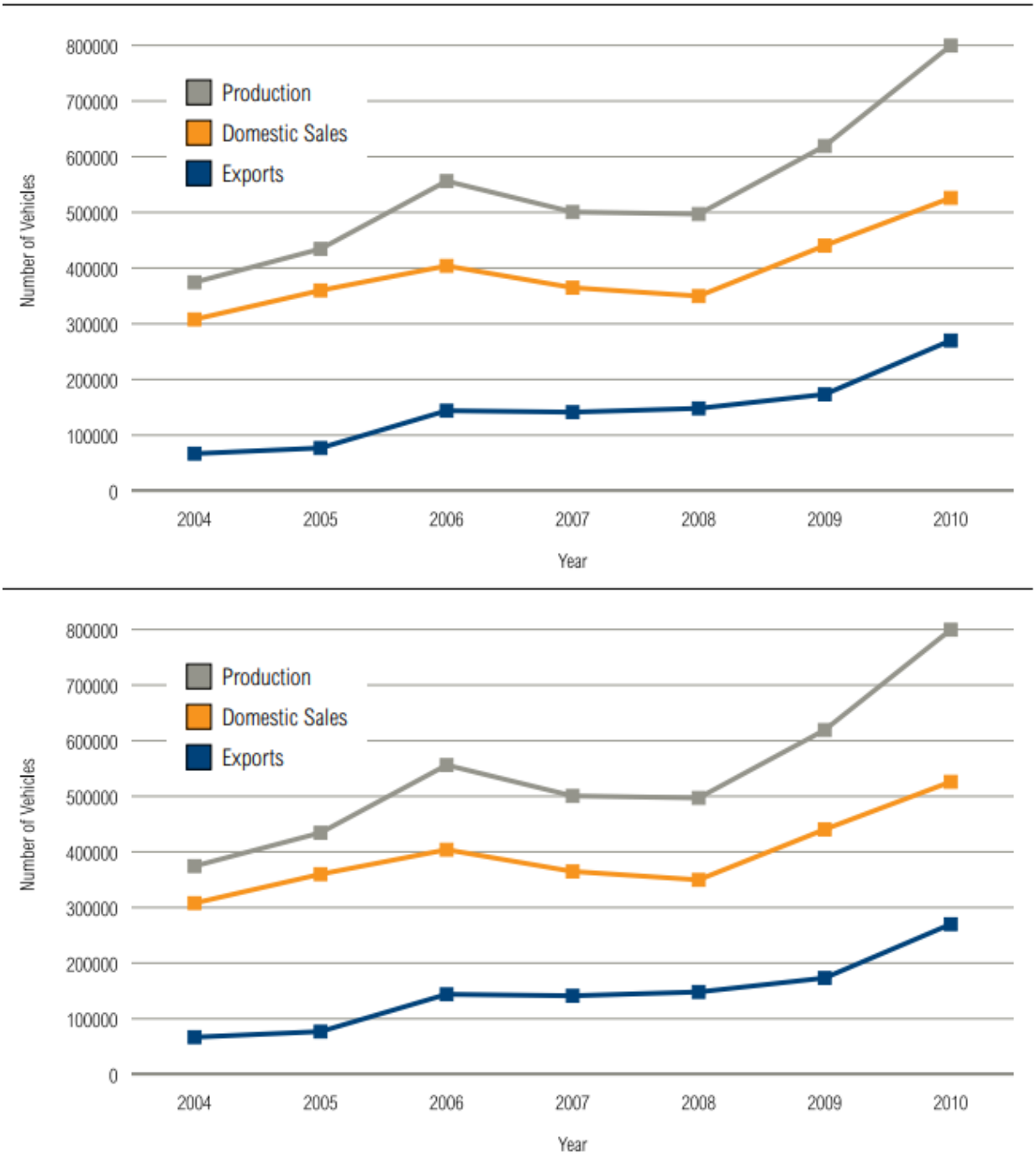
The Auto-rikshaw connectivity ensures that there is door to door transport from one place to another as the services that are generated by the auto-rikshaws will ensure that the transportation needs that require door to door connectivity such as occasional trips to the airports or other places, emergency outgoings or emergency trips for healthcare, can be met in the city without the overdependence on private vehicles and private motorization.

MARKET SIZE AND SALES TRENDS.



Market Size of Auto-rickshaws for Select Indian Cities, 2010(FIG 2)

The market size of auto-rickshaws in cities currently varies from around 15,000 to 30,000 in Tier II cities (population between 1 and 4 million) to quite 50,000 in Tier I cities (population greater than 4 million) (Figure 2). supported population statistics, it's estimated that Tier I and II cities have 4 to 16 auto-rickshaws serving every 1,000 people on an average (Figure 2)



Trends in Auto-rickshaw Production, Domestic Sales and Exports in India, Fiscal Year 2004 to 2010(FIG 3)

Industry statistics on auto-rickshaw production and sales between 2003 and 2010 are presented in figure 3. These statistics show that the auto-rickshaw market is growing. While a part of the domestic sales are related to the agricultural and semiurban market, domestic sales are being driven by the growing auto-rickshaw market particularly in Tier II and Tier III cities (Tier III

cities are those with a population of but 1 million), also as by replacement sales—scrapping old vehicles and replacing them with new ones—in Tier I cities.

Characteristics of auto-rickshaw users are often assessed in terms of the trip purposes served by auto-rickshaws, for instance, work, education, shopping, health care, and recreation. supported published statistics linking mode shares with trip purposes for select cities, table 3 shows the mode share of auto-rickshaws for various trip purposes.
As seen from table 3, people use auto-rickshaws for a spread of purposes, including education, shopping, health care, recreational trips, and commuting to the figure.

VEHICLE PERFORMANCE AND NEED FOR IMPROVEMENTS.

This subsection looks at the performance of the motorized three-wheeler (auto-rickshaw) in Indian cities with reference to emissions and road safety, with the target of identifying current sustainability challenges and areas for vehicle-related reforms in the auto-rickshaw sector to market sustainable urban transport.

EMMISIONS:

Among the varied emission categories, emissions of particulate of aerodynamic diameter of less than 10 microns (PM10), also mentioned as respirable suspended particulate (RSPM), is of critical concern within the auto-rickshaw sector. This can be traced to the subsequent issues:

a. ADVERSE EFFECTS OF PM10 EMMISIONS:

High ambient concentration of PM10 in cities in developing countries has adverse impacts on public health, including increased morbidity and premature mortality (Shah and Iyer 2004). Consistent with a recent national air quality monitoring study in Indian cities (Bangalore, Chennai, Delhi, Kanpur, Mumbai, and Pune) conducted by the Central Pollution control panel

(CPCB) (CPCB 2010), among all the standards pollutants, PM10 is one among the foremost critical pollutants in most the study cities from a public health perspective.

EXISTENCE OF CONVENTIONAL TWO-STROKE AUTO RIKSHAW IN CITIES:

The CPCB study (CPCB 2010) found that the transport sector contributed to between 15 and 50 percent of the PM10 emissions within the study cities, at residential and CURBSIDE locations. Among the transport sector sources, the study reported diesel heavy-duty vehicles and auto-rickshaws to be primary sources of PM10 emissions. within the autorickshaw sector, the PM10 emissions problem is caused by conventional two-stroke engine vehicles, which are noted to be major sources of PM10 emissions due to scavenging losses (loss of some of the intake fuel through the exhaust port without being combusted), misuse of grease , inadequate maintenance and poor performance or lack of catalytic converters (Shah and Iyer 2004).

Therefore, strategies to address the PM10 emissions problem in cities must consider ways to reduce PM10 emissions from the auto-rickshaw sector, particularly from conventional two-stroke engines.

Studies have shown that it will be difficult to control PM10 emissions simply by retrofitting existing conventional two-stroke engines. RTO surveys conducted by EMBARQ India for this study found that more than 80 percent of the auto-rickshaws in Rajkot, Surat, and Pune had conventional two-stroke engines.

THESE WERE THE AREAS FOR A NEED FOR IMPROVEMENT THE IMPROVEMENTS ARE AS FOLLOWS:

TRANSITION TO FOUR STROKES ENGINE:

These challenges indicate that reducing PM10 emissions from the auto-rickshaw sector would entail moving to an improved four-stroke internal-combustion engine technology rather than retrofitting existing conventional two-stroke engines. Shah and Iyer (2004) have noted that for an equivalent fuel like gasoline, four-stroke engines have significant advantages over two-stroke engines in terms of (1) fuel economy; (2) lower PM10, Hydrocarbon (HC), and CO2 emissions; (3) lower noise levels; and (4) being a long-time technology.

The challenge with four-stroke engines, however, is higher NOx emissions compared to two-stroke engines (Shah and Iyer 2004). NOx is reported to end in the formation of tropospheric ozone, which has harmful health impacts (EPA 2011). Industry experts have noted, however, that this issue are often addressed through reforms in regulation on emission standards (Iyer 2010; e-mail from Anup Bandivadekar and Francisco Posada of the International Council on Clean Transportation, October 2011).

Current regulation, which needs compliance on a combined HC and NOx standard (HC + NOx), allows four-stroke engines to satisfy the combined standard, because of their low HC emissions, albeit NOx emissions are high.

ALTERNATIVE FUELS AND ELECTRIC VEHICLES:

A transition from two-stroke to four-stroke engines also provides a chance to scale back PM10 emissions further by moving from gasoline to alternative fuels like CNG and liquefied petroleum gas (LPG) (Shah and Iyer 2004).

Reynolds, Grieshop, and Kandlikar (2011) report that four-stroke engines have lower PM10 emissions with CNG than do two-stroke engines. However, the feasibility of other fuels within the auto-rickshaw sector as a PM10 emissions mitigation strategy has got to take under consideration issues like (1) the adequate availability of fuel and distribution infrastructure and (2) the long-term economics of other fuels vis-à-vis gasoline.

Electric vehicles may present a plausible long-term alternative to the transformation of two-stroke to four-stroke engines within the auto-rickshaw sector. The biggest advantage of electrical vehicles is that the elimination of tailpipe emissions, which may help improve urban ambient air quality.

However, the feasibility of electrical vehicles for the auto-rickshaw sector would depend upon life-cycle costs, the presence of recharging infrastructure for batteries, payload weight, range of auto , and favourable government policies, which remain to be seen in India (Shah and Iyer 2004).

The NUTP, to an extent, provides the right policy vision for promoting sustainable urban transport in cities by focusing on planning and improvements in public transport:

PROMOTING PUBLIC TRANSPORT THROUGH IMPROVED CONNECTIVITY

Additionally to serving occasional and emergency trips, auto-rickshaw services can play a crucial role in making public transport accessible to all or any parts of the town , and inspiring daily commute trips on conveyance by providing first and walk connectivity. As feeder services, auto-rickshaws will make sure that conveyance is accessible to commuters with special needs, like the elderly and other people with disabilities.

REDUCING PRIVATE MOTOR VEHICLE USAGE AND IMPROVING DOOR TO DOOR TRANSPORT ALTERNATIVES:

While the NUTP recognizes the role of auto-rickshaw services in serving occasional and emergency trips, it does not acknowledge that auto-rickshaws provide a door-to-door transport alternative to private motor vehicles. As discussed earlier, reducing private motor vehicle usage while providing quality transport alternatives is an integral part of the ASI framework to promote sustainable urban transport.

Thus, the policy vision should recognize that provision of quality auto-rickshaw service in cities is a crucial part of the strategy to assist reduce private automobile usage. It should also highlight the necessity to enhance auto-rickshaw services to form them a beautiful door-to-door transport alternative to non-public automobiles in serving occasional and emergency trips.

Thus the thing is that the Auto-Rikshaw sector is one of the most important sectors to have a look into if we want to increase the Urban transportation Sustainability.

With the Auto-rikshaw sector the other sectors such as the Railway sector, Bus Sector, Private Vehicle sector and many other sectors play a heavy role in the transformation of the Indian economy's transportation sector.

4.2 SMART CITIES

WHAT IS A SMART CITY?

A 'smart city' is an urban region that's highly advanced in terms of overall infrastructure, sustainable land, communications and market viability. it's a city where information technology is that the principal infrastructure and therefore the basis for providing essential services to residents. so far the federal has shortlisted the establishment of '109 smart cities' in India. The key idea of smart cities is that the alliance of public services with an integrated conveyance system. Information Technology, therefore, will play an important role in both integrating and automating these services.

INDIAN GOVERNMENT ON SMART CITY DEVELOPMENT

The federal government of India has launched two flagship programmes – 100 Smart Cities and Atal Mission for Rejuvenation, and Urban Transformation (AMRUT) for 500 cities that have a population of 100,000 or more, with funding of $8 billion and $8.3 billion, respectively. The smart cities initiatives focus on core infrastructure service, whereas, AMRUT will adopt a project approach to ensure basic infrastructure services.

The Indian government is in a great need for a change and the Indian citizens as well there is a change coming with the efforts

The 20 cities within the first stage will receive INR 2 billion (US$ 30 million) in 2015-2016 and INR 1 billion (US$ 15 million) per annum for the subsequent three years; a complete of INR 5 billion (US$ 75 billion). State governments and respective urban local bodies also will contribute an equivalent amount. Many foreign countries, including Japan, France, Germany, Singapore etc. have come to the fore to support the federal government's decide to develop smart cities

SUSTAINABLE TRANSPORT AND SMART CITIES:

Smart cities can't be built without smart conveyance. Under the smart cities programme, the cities are required to create efficient urban mobility and public transportation by creating walkable localities, also as promoting a spread of transport options. However, there's no clear guideline for developing a sustainable public transportation. An urban transport system is subject to planning, execution and development by the states and union territories; hence, under the smart cities programme each city can prepare its 'Smart City Vision' document, highlighting the city's vision and funding proposal.

Sustainable transport can be achieved with smart cities in the following ways:

a. THE EMERGENT USE OF METRO SYSTEMS:

Metro are interconnected railway networks that have proven to be very efficient in nature an in order to gain sustainable development in urban transportation it is important that they are implied upon.

After the success of the Delhi Metro, lots of Indian cities are exploring the option of implementing metro rail networks. The Ministry of Urban Development (MoUD) estimates that there is approximately 316km of metro lines currently in operation and more than 500km of metro lines under construction across the country. This includes metro/mono rail systems promoted by state governments and private bodies.

Delhi Metro is the largest metro system with a total length of 213km, carrying 2.8 million passengers a day. Some of the new metro systems are still facing issues with building ridership; for example, Jaipur Metro carries only 20,000 passengers per day, incurring a loss of INR 30 million (US$ 500,000) every month.

Delhi Metro is India's largest and most successful metro system, carrying approximately 2.8 million passengers a day.

Most of the systems are developed by public authorities with external funding and support from federal . However, a number of the cities have developed the system in partnership with private players e.g. Gurgaon (operated by IL&FS), Mumbai (operated by RATP) and Hyderabad (operated by Keolis – under development). within the Union Budget 2014-2015, the govt emphasised that the design of metro projects must begin now. The federal has earmarked INR 100 billion (US$ 1.5 billion) for metro projects within the fiscal budget 2016-2017.

b. REVAMPING THE BUS SYSTEM:

Figure 2: How India travels.

Buses are the foremost popular and convenient mode of transportation in urban cities. quite 1.6 million buses are registered in India, and therefore the public bus sector operates 170,000 buses carrying roughly 70 million people per day. However, bus transportation has not been ready to cater to the growing travel demand.

There are only 30,000 buses serving the town areas, out of which approximately 3,500 buses are operated under a public-private partnership agreement. All bus operators are incurring huge losses and don't have funds for the capital investment needed to acquire new vehicles and technology. the typical age of the fleet ranges from two years to 11.8 years for state bus transport undertakings.

The National Sample Survey Office (NSSO) carries out an annual survey of household expenditure on service and durable goods in India. As per the details of expenditure on transport, buses are the most preferred mode of transport in both rural and urban India, followed by auto rickshaws. The federal launched National reclamation Mission (NURM) in 2009 and embarked upon a huge programme of revitalising urban areas by allocating national funds to hurry up the creation of much-needed infrastructure. The programme was split in two phases and was concluded in 2015. Approximately 222km of Bus mass rapid transit (BRT) systems are operational and therefore the remaining 282km are under construction. MoUD has provided financial assistance to 11 cities for the development of 504km Bus mass rapid transit System (BRTS).

In order to generate more investment in the sector, the federal government has proposed to open the public bus sector to private companies. This will allow buses to operate on nationalised routes. According to the Road Transport Ministry, the opening of the sector will increase the passenger ridership to 120-150 million per day.

FUTURE BUS TECHNOLOGY:

India's federal government has recognised the need to invest in bus technology. Copyright: UITP

The federal government has unveiled an ambitious project to replace all public bus transport fleets with hybrid technology. The government launched the full indigenous retro-fitted electric bus, converting existing conventional fuel buses into electric buses, developed by KPIT Technologies and Central Institute of Road Transport (CIRT).

A main hindrance to the adoption of latest technology is that the financial implication and cost of capital . the typical cost of a hybrid bus in India is around INR 23 million (US$ 375,000), compared to INR 9 million (US$ 150,000) for a premium diesel bus. so as to incentivise the operators to acquire electric and hybrid buses, the federal has launched the 'Faster Adoption & Manufacturing of electrical and Hybrid Vehicle (FAME)' scheme to supply a subsidy of INR 6.1 million (US$ 100,000) for electric and hybrid buses.

Currently Navi Mumbai Municipal Transport (NMMT) has procured five hybrid city buses from Volvo and MMRDA has procured 25 hybrid buses from Tata Motors. There are currently no fully electric buses in commercial operation. BYD has completed a pilot in Bangalore (2014) and Delhi (2016) to demonstrate electric bus technology.

c. INNOVATIVE TECHNOLOGY

The Mumbai Metro currently has one line and 12 stations. There are plans to extend the network.

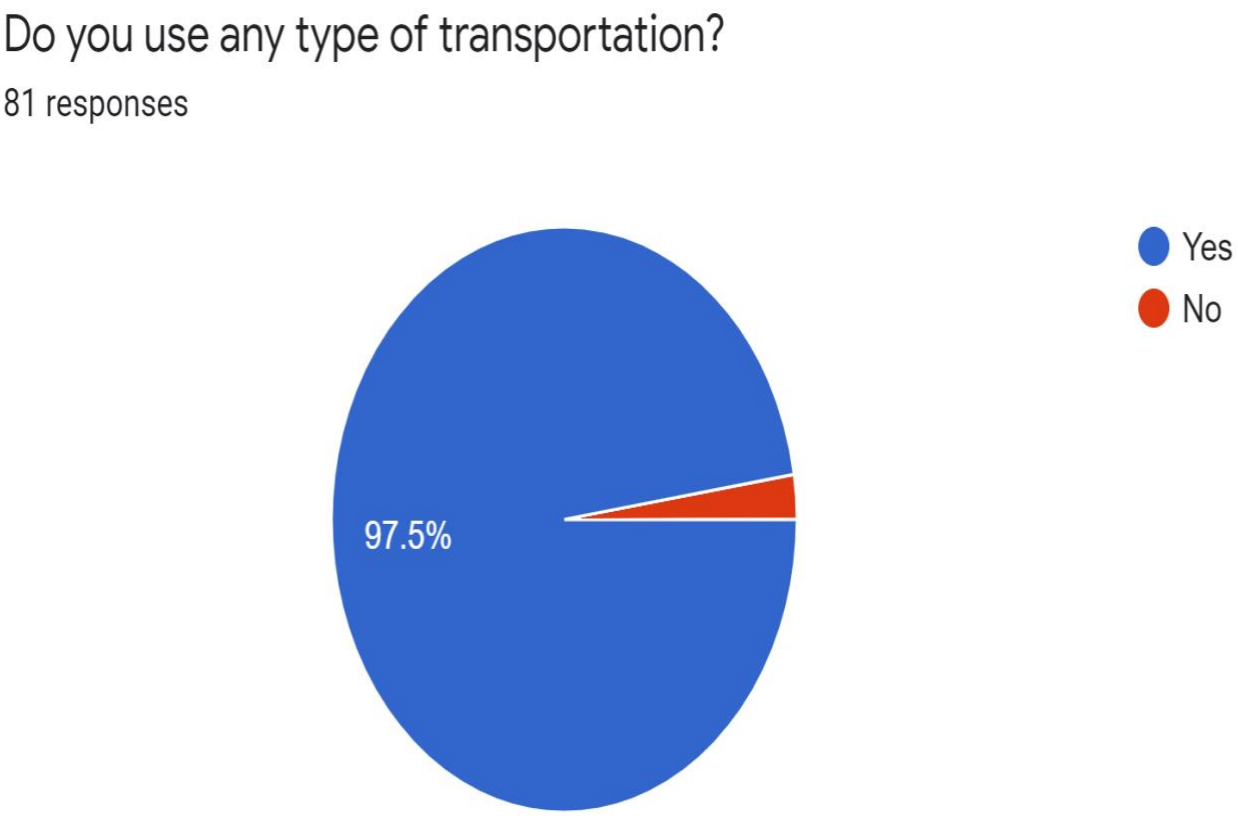
A main hindrance to the adoption of latest technology is that the financial implication and cost of capital . the typical cost of a hybrid bus in India is around INR 23 million (US$ 375,000), compared to INR 9 million (US$ 150,000) for a premium diesel bus. so as to incentivise the operators to acquire electric and hybrid buses, the federal has launched the 'Faster Adoption & Manufacturing of electrical and Hybrid Vehicle (FAME)' scheme to supply a subsidy of INR 6.1 million (US$ 100,000) for electric and hybrid buses.

Smart ticketing has been slow to realize popularity in India. All metro systems have implemented smart ticketing solutions for its 'closed' environment; Delhi Metro sells approximately 16,000 smartcards each day and 1.8 million commuters use the cardboard daily. However, the smart ticketing systems aren't yet integrated with the bus system. The federal did make plans to introduce a sensible National Common Mobility Card (NCMC) to enable seamless travel using different modes of transport across the country also as having retail purchasing benefits. However, the initiative didn't begin . In July 2015 the govt established a committee to recommend an inter-operable smartcard.

The development of waterborne transportation is one of the key priorities of the federal government in India. The 2016 National Waterway Act was enacted in March 2016 to regulate the development of 111 national waterways, out of which 106 are new national waterways. Currently India is conducting only 3.5% of trade through waterborne transport, compared to 47% in China; 40% in Europe; 44% in Japan and Korea; and 35% in Bangladesh

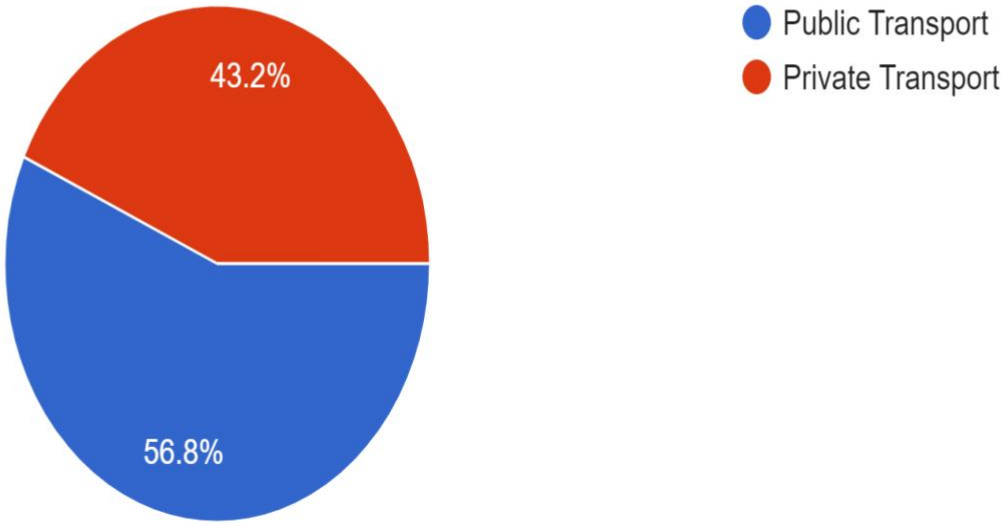
India still has much ground to form up to realize efficient and sustainable city conveyance systems. the general public infrastructure will improve the mobility of individuals and can open the door to new economic opportunities for the country. Investment publicly transportation features a multiplier effect for the economy.

DATA INTERPRETETION



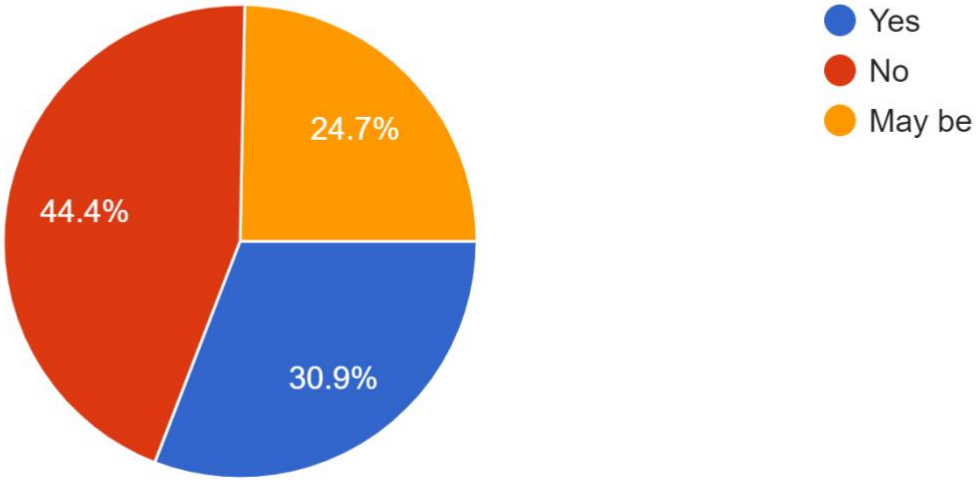
Which type of transportation modem do you mostly prefer?

81 responses



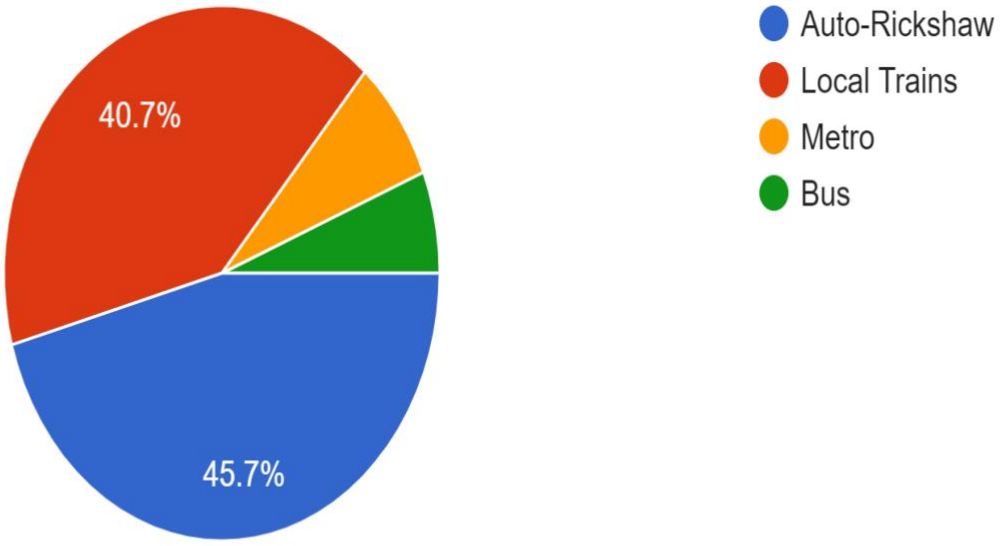
Do you have any Idea about Sustainable Urban Transport?

81 responses



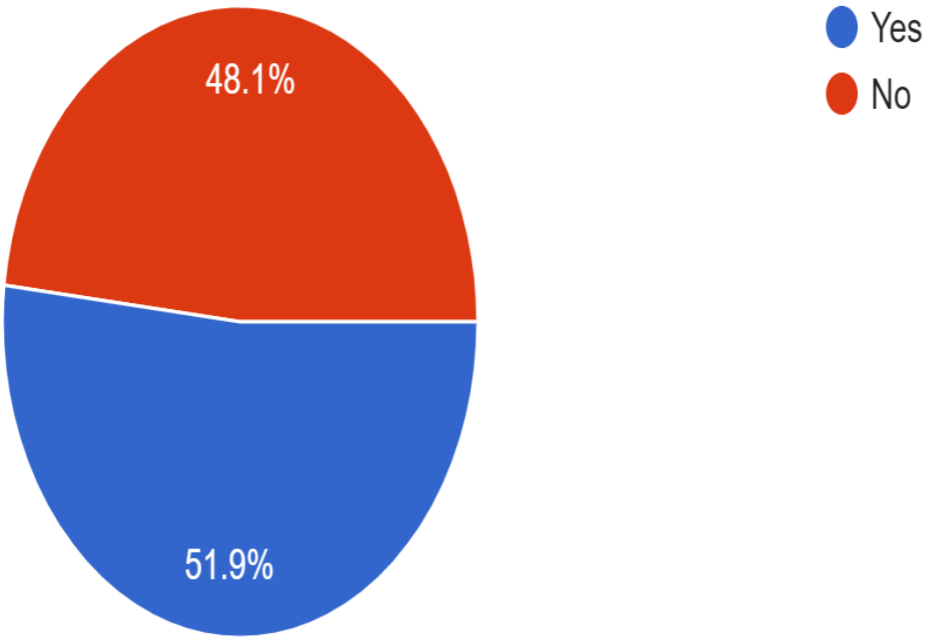
Which type of Public Transport do you use most often?

81 responses



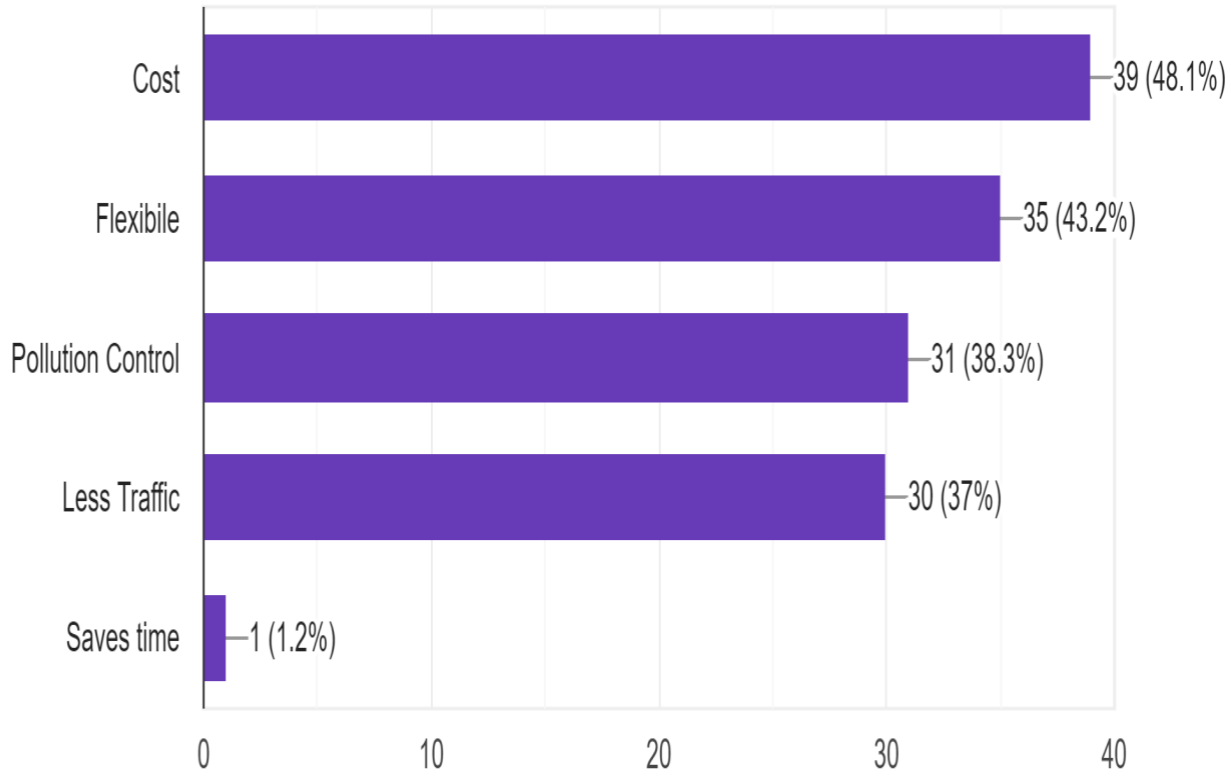
Are you satisfied with today's transportation services?

81 responses



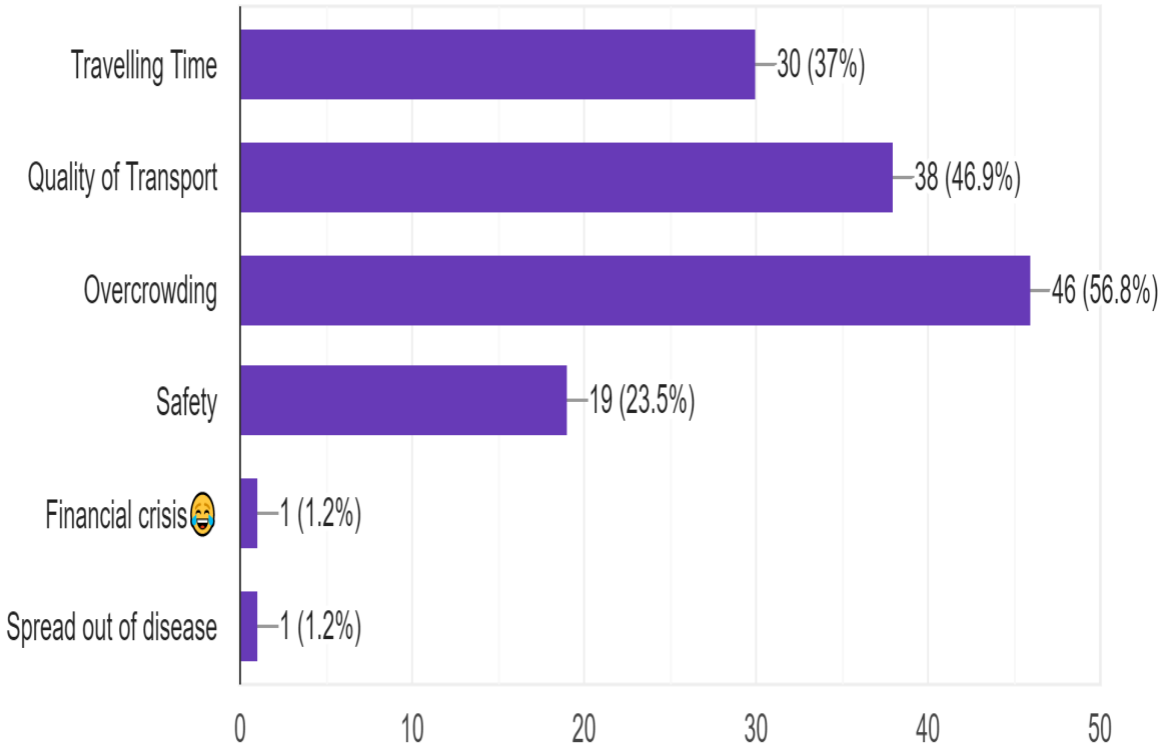
What are the advantages of using public transport?

81 responses



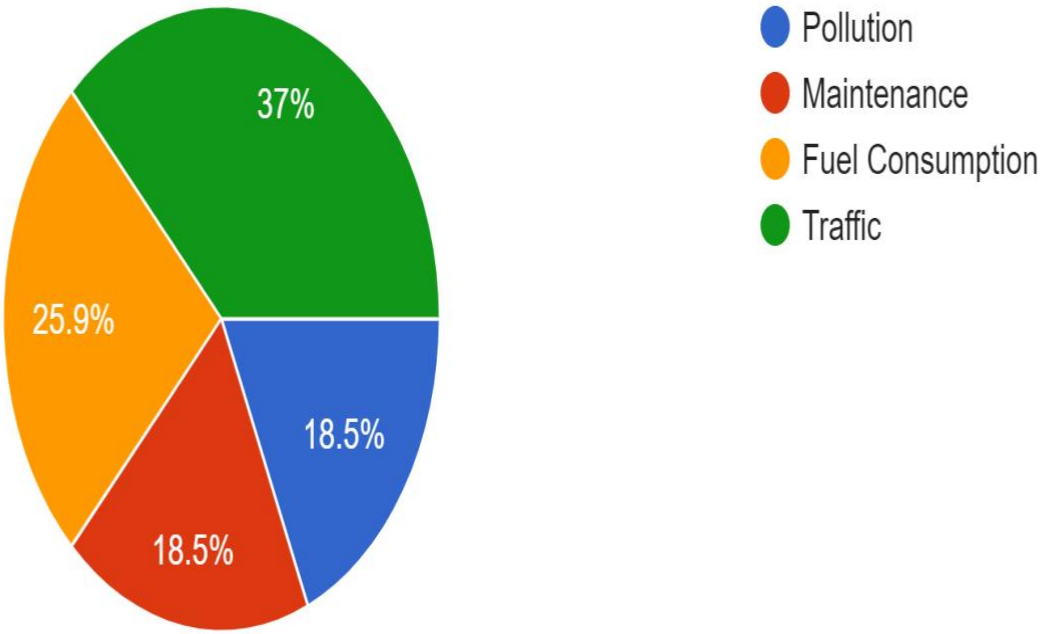
What are the problems that you may face on a regular basis?

81 responses



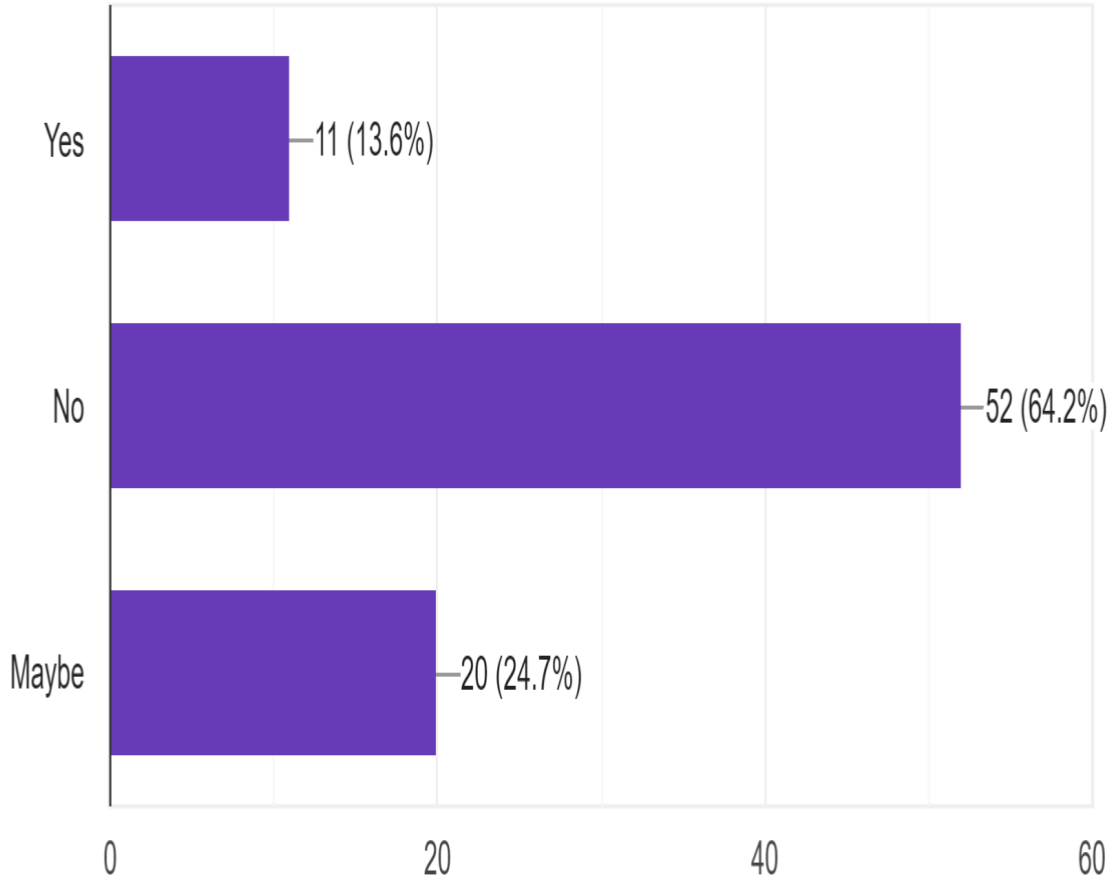
What are the problems faced by you while using private transport?

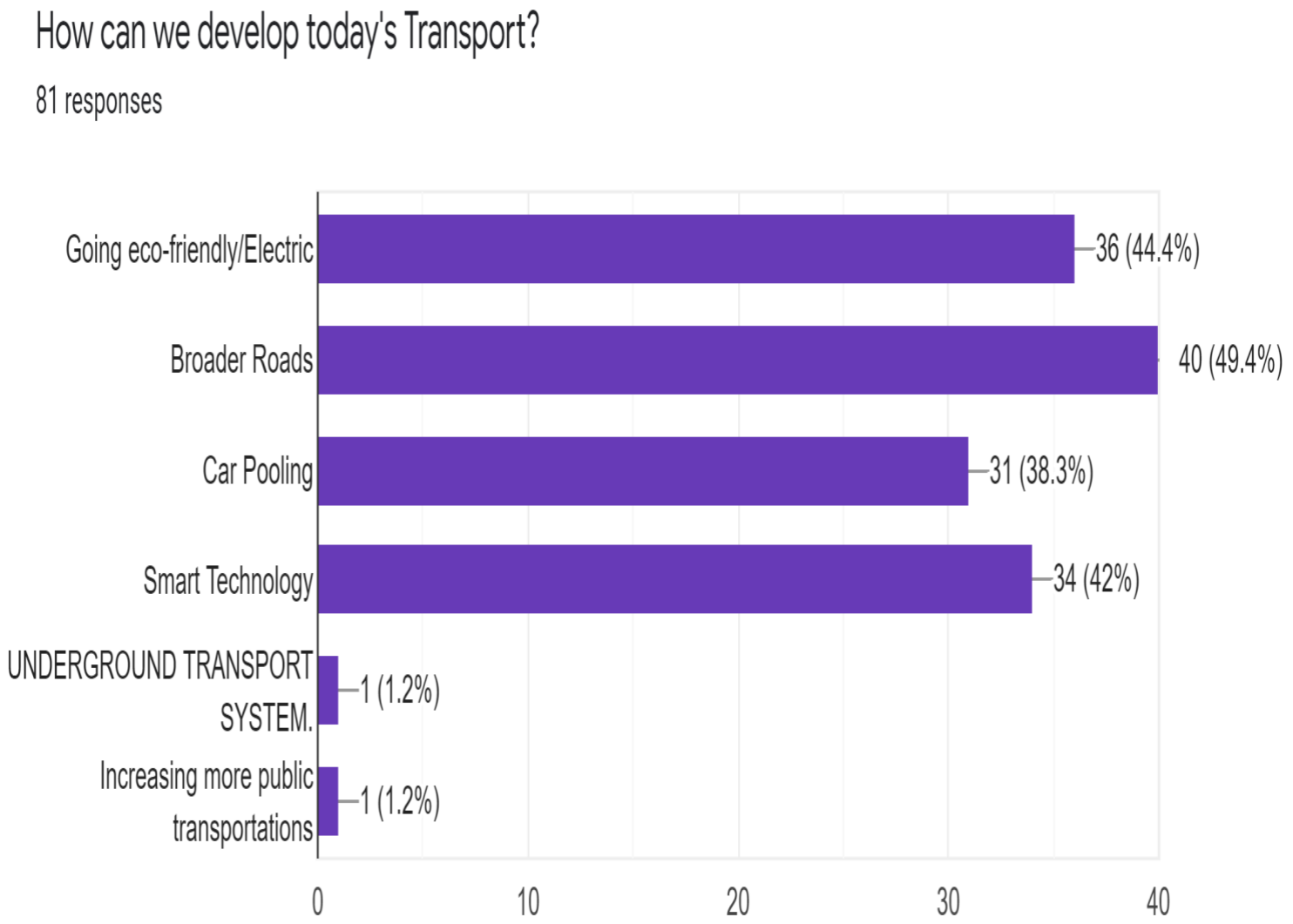
81 responses



Do you think the current transportation is well developed?

81 responses





CONCLUSION

 Road Communication plays a crucial role in promoting economic, social and cultural development of the Marathwada region.

 Roads are definitely a cost efficient and popular mode of transport. It helps in the movement of men and material from one mode to another. It forges national unity and is instrumental in the nation's socio economic development.

 Road transport in India contributes to 60 per cent freight or cargo transport and 80 per cent passenger transport of India.

 An efficient road transport system is a pre-requisite for sustained economic development.

 Transport investments within cities and across cities are essential for economic growth, job creation, and poverty reduction.

 India has an extensive road network and provides amenity to millions of people every day, thus road transport is one of the important ingredients for the social and economic development of the country.

 India has the third largest road network in the world stretching 3.32 million kilometers in length.

These are some of the conclusions that help understand the main idea and the main width of the topic that we have discussed.

From our findings we can clearly see that people do have some problems with the transportation facilities that we have today

The development first should be made on a micro level and then further we should encourage to build upto a macro level.

These are some of the conclusions that are made by me after this research.

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