



# Improving and Upgrading IPT Vehicles and Services: A Study

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## **Acknowledgement**

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This study has been undertaken by a team led by Ms Kanika Kalra, (Urban Transport Expert, IUT) with support from Ms Anindita Ghosh (Transport Planner, IUT), Mr. Namit Kumar (Transport Planner, IUT) and Ms Marion Hoyez (Intern 2014, IUT). The team is also thankful to Mr. O.P .Agarwal (Present Director General, IUT) and Mr B. I Singal (Former Director General, IUT) for their constant guidance and support and very important source of inspiration and mentor for the conduct of this study.

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## List of Abbreviations

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- AVL** : Automatic Vehicle Location
- CEO** : Chief Executive Officer
- BRT** : Bus Rapid Transit
- BRTS** : Bus Rapid Transit System
- BS** : Bharat Stage
- CCS** : Central Control Station
- CCTV** : Closed-circuit Television
- CDIA** : Cities Development Initiative for Asia
- CMC** : Common Mobility Card
- CNG** : Compressed Natural Gas
- CPCB** : Central Pollution Control Board
- CSE** : Centre for Science and Environment
- DART** : Dar Rapid Transit
- DDD** : Dakar Dem Dikk
- DI** : Direct Injection
- DIMTS** : Delhi Integrated Multi-modal Transport System
- DOL** : Department of Labor
- DOT** : Department of Transport
- DRI** : Direct injection
- DTI** : Department of Trade and Industry
- DTO** : District Transport Office
- DTSI** : Digital Twin Spark ignition
- EGR** : Exhaust Gas Recirculation
- EIG** : Economic Interest Group
- EMI** : Equated Monthly Installment

**EMS** :Electronic Merchant System

**ETM** :Electronic Ticket Machine

**GHG** :Greenhouse Gas

**GPRS** :General Packet Radio Service

**GPS** :Global Positioning System

**GTR** :Global Technical Regulations

**HC** :Hydrocarbon

**ICCT** :International Council on Clean Transportation

**IDA** :International Development Association

**IPT** :Intermediate Public Transport

**ITS** : Intelligent Transport System

**JnNURM** :Jawaharlal Nehru National Urban Renewal Mission

**LCD** :Liquid-Crystal Display

**LED** :Light-emitting diode

**LPG** :Liquified Petroleum Gas

**MoEF** :Ministry of Environment and Forest

**MORTH** :Ministry of Road Transport and Highways

**MoU** :Memorandum of Understanding

**MoUD** :Ministry of Urban Development

**MV** :Motor Vehicles

**NCR** :National Capital Region

**NGO** :Non-Governmental Organisation

**NMHC** : Non Methane Hydro Carbon

**NMT** :Non-Motorized Transport

**NOx** : Nitrogen Oxydes

**NTTT** :National Taxi Task Team

**NPS** : New Pension System

**NUTP** : National Urban Transport Policy

**NTDPC** :National Transport Development Policy Committee

**ONGC** :Oil and Natural Gas Corporation

**PIS** :Passenger Information System

**PM** : Particulate matter

**PPP** : Public-private partnership

**PT** : Public Transport

**RBI** : Reserve Bank of India

**RE-GDI** : Rear Engine-Gasoline Direct Injection

**RHC** : Reactive Hydro Carbon

**RTA** : Regional Transport Agency

**RTO** : Regional Transport Office

**SPV** : Special Purpose Vehicle

**SUMATRA** : Surface and Marine Transport Regulatory Authority

**SC** : Scheduled Caste

**SIAM** : Society Of Indian Automobile Manufacturers

**ST** : Scheduled Tribe

**STU** : State Transport Undertakings

**TMC**: Traffic Management Centre

**TMS** : Traffic Management System

**TWUISPL**: Two-Wheels United India Services Private Limited

**UNECE** : United Nation Economic Commission of Europe

**WMTC**: World Harmonized Test Cycle

**WRI** : World Research Institute

# Table of Contents

---

<b>Executive Summary</b> .....	4
1. Background.....	18
2. Intermediate Public Transport: Concepts .....	27
3. Case Studies.....	32
4. City Analysis.....	48
5. Observations & Issues .....	64
6. IPT Technology and Emissions Standards .....	73
7. Usage of Intelligent Transport System .....	92
8. Alternative Scenarios Development--Financial Model for IPT Vehicles.....	101
9. Institutional Framework for IPT .....	109
10. Recommendations.....	118
11. Conclusion & Way Forward .....	132

## List of Figures

Figure 1-1: Modal Split of Indian cities .....	18
Figure 1-2: Impact of Public Transport on IPT Index .....	19
Figure 1-3: No. of IPT Vehicles in Selected Cities per 1,000 People (Source: WRI, Sustainable Urban Transportation Policy Brief) .....	20
Figure 1-4: Future Trend of Mode Share in Indian Cities (Source: MoUD, 2008) .....	20
Figure 1-5: Methodology of the Study .....	25
Figure 2-1: Classification of IPT Modes According to WRI, Embarq .....	28
Figure 3-1: Kombi Minibu—South Africa .....	32
Figure 3-2: Angkots .....	36
Figure 3-3: Becak.....	37
Figure 3-4: Ojeks .....	37
Figure 3-5: Dolmus.....	39
Figure 3-6: Dolmusa Routes.....	40
Figure 3-7: Fast Bus.....	41
Figure 3-8: Daladals.....	43
Figure 3-9: Daladals Route map .....	43
Figure 3-10: ITS Fitment in the Autos .....	45
Figure 4-1: IPT Vehicles/Lakh Population .....	48
Figure 4-2: Tempos/Vikrams.....	49
Figure 4-3: A Three-Seater Autorickshaw .....	49
Figure 4-4: IPT Composition.....	50
Figure 4-5: Routes Fixation of IPT Vehicles.....	50
Figure 4-6: Fare Meter .....	51
Figure 4-7: Fares Fixation.....	51
Figure 4-8: Vehicle Technology.....	52
Figure 4-9: Fuel Type.....	52
Figure 4-10: IPT Vehicles Queuing on the Sides of the Roads.....	52
Figure 4-11: New Permit and Renewal Fees.....	54
Figure 4-12: Educational Qualification Levels.....	54
Figure 4-13: Ownership of Vehicles .....	54
Figure 4-14: Rent/Day.....	55
Figure 4-15: Average Kms/Day Driven.....	55
Figure 4-16: Average Passengers/Day .....	56
Figure 4-17: Auto Unions .....	59
Figure 4-18: Financing Options .....	60
Figure 4-19: Age Group Usage .....	60
Figure 4-20: Trip Purpose.....	61
Figure 4-21: The Distance Travelled by Passengers.....	61
Figure 4-22: Expenditure/Month on IPT.....	62
Figure 6-1: Annual Production of Three Wheelers in India in the Last Five Years (ACMA 2011).....	73
Figure 6-2: Domestic Sales and Exports of three wheelers (SIAM, 2011) .....	73
Figure 6-3: Relative Proportions of Diesel and Petrol/Gas in Different Categories (SIAM, 2011).....	74

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Figure 6-4: Comparison of PM Emission Factors (g/km) of Autorickshaws (post 2000 models) .....	74
Figure 6-5: PM and HC Emissions in Delhi .....	75
Figure 6-6: HC and CO emissions ICCT's India Emissions Model, in 2010 .....	75
Figure 7-1: Panic Button .....	93
Figure 7-2: Traffic Management Centre .....	94
Figure 7-3: E-Challan Machine .....	95
Figure 7-4: Status Panel .....	96
Figure 7-5: Smart Card Reader.....	97
Figure 9-1: Structure of SPV .....	115



## List of Tables

<b>Table 1-1: List of Cities Selected for the Study Along with their Population</b> .....	24
<b>Table 2-1: Criteria for Different Modes of Transport</b> .....	27
<b>Table 4-1 Revenue earned/month—general services</b> .....	57
<b>Table 4-2 Maintenance cost/month</b> .....	58
<b>Table 4-3 Total savings/month</b> .....	58
<b>Table 4-4: Pros and Cons of IPT services</b> .....	62
<b>Table 6-1: Emission standards for gasoline IPT vehicles in India, g/km</b> .....	77
<b>Table 6-2: Emission standards for Diesel IPT vehicles in India, g/km</b> .....	78
<b>Table 6-3: Emission standards In use gasoline/CNG/LPG IPT vehicles</b> .....	78
<b>Table 6-4: Suggested emission standards for 3 wheelers</b> .....	80
<b>Table 6-5: Specifications of three wheelers produced by Bajaj (2011)</b> .....	81
<b>Table 6-6: Performance comparison of two stroke and four stroke autorickshaws</b> .....	83
<b>Table 6-7: Fuel economy of two-stroke and four-stroke vehicle engines</b> .....	86
<b>Table 7-1: Summary Table of the components and their characteristics</b> .....	98
<b>Table 7-2: Summary Table showing benefits to the stakeholders</b> .....	99
<b>Table 8-1: Merits and Demerits of Government Self Scheme</b> .....	102
<b>Table 8-2: Merits and Demerits of Nationalised Bank Scheme</b> .....	103
<b>Table 8-3: Merits and Demerits of Micro Financing Scheme</b> .....	104
<b>Table 8-4: Ecocabs model of Fazilka</b> .....	105
<b>Table 8-5: Merits and Demerits of Separate Private Company</b> .....	106
<b>Table 8-6: Merits and Demerits of Corporate Financing</b> .....	106
<b>Table 8-7: Merits and Demerits of SPV formation</b> .....	107
<b>Table 9-1: Merits and demerits of Complete Government Initiative</b> .....	109
<b>Table 9-2: Merits and demerits of Private Ownership</b> .....	110
<b>Table 9-3: Merits and demerits of NGOS/ Private ownership</b> .....	111
<b>Table 9-4:Merits and Demerits of Net cost model</b> .....	113
<b>Table 9-5: Merits and Demerits of Gross Cost Model</b> .....	114
<b>Table 10-1: The number of permits to be issued under various scenarios</b> .....	120
<b>Table 10-2: Estimated Route Permit Fees</b> .....	121
<b>Table 10-3: Expected Fare per Kilometer</b> .....	130
<b>Table 10-4: Expected Fare per Kilometer</b> .....	130

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## EXECUTIVE SUMMARY

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### Introduction

India is witnessing rapid urbanisation and motorisation. While the urban population is growing at the rate of 3.16 % per year, motor vehicles are growing at a rate of 9%. (Sharma, Jain, and Singh, 2011). Today, buses constitute less than 1% of the total registered vehicles in Indian cities (Road Transport Yearbook, 2011-12). In fact, very few Indian cities have organised, regularised and regulated public transport system. In the absence of an organised city bus service, the gap is being filled by intermediate public transport (IPT) modes like 3-wheelers auto-rickshaws, Tempos and Tata magic, etc which provide public transport services (India Transport Report- Moving India to 2032, 2014).

The Central Government's recent policy initiatives, such as the 2005 Jawaharlal Nehru National Urban Renewal Mission (JnNURM) and the National Urban Transport Policy (NUTP), 2006 aim to provide a vision and framework to promote sustainable urban transport in India. The recent recommendations of the working group on urban transport, both for the 12th Five Year Plan and the NTDP, stress the need to improve the IPT services due to their potential of providing clean mobility and low emissions solutions. This study focuses on the major challenges the IPT service sector faces and the recommendations to organise and regularise the transport system in Indian cities.

### Literature Review

The concept of IPT differs between developed and developing countries. In developed countries, IPT is often used as a demand responsive system such as shared-ride taxis and dial-a-ride services. In developing countries, however, the lower standard of living, high population density and easy availability of cheap labour together generate the demand for a variety of transport modes. The several benefits include mobility and connectivity, market responsive services and low-cost travel option. Depending on a city's size and transport expectations, IPT modes may fall under two broad categories: 1) contract carriage services, which are flexible demand-based services where the passenger determines the destination and 2) informal public transport services, characterized by a fixed route with intermediate stops for boarding and alighting. Indian cities use both these IPT modes.

This sector faces tremendous challenges in Indian cities due to their un-regularised nature of operations. Case studies from developing countries like minibus taxis of South Africa, the IPT system of Indonesia, Dolmus of Turkey, G-Auto of Ahmedabad etc, were referred, to understand the initiatives these cities took to improve the transport services. All the case studies indicate that the key ingredients for a sustainable IPT system are as follows:

- Strong regulatory authority fixing the routes, fares, laws
- Provision of proper infrastructural facilities like parking areas, stands, separate lanes, etc.
- Provision of financial and social benefits to drivers through government schemes
- Usage of modern technologies to organise the system.

### **Methodology**

The methodology for the study is broadly divided in three stages: literature review, field visit, and recommendations. In the literature review stage, the study discussed the basic challenge the IPT sector faced in various cities and the measures taken to address those challenges. The first stage was complemented with a study of 19 Indian cities, for which field visits were made to understand the ground conditions. The second stage was marked by a discussion of the questionnaire with more than 30 city officials (RTO and Traffic Police) and a primary survey of more than 1,900 drivers/auto unions, in 19 cities (selected based on population size) across India (Refer to Table 1-1). The sample size considered for the primary survey varies between 0.1% and 1%, depending on the total number of registered IPT vehicles in the city. The analysis of cities was done based on the three categories listed in the table below. The discussions with the stakeholders led to an understanding of the existing system and identification of gaps and problems in the sector. This was followed by the final stage of the study, which provided suggestions and recommendations for improving the system.

S.No.	Population size	Number of cities	Name of the city
1	5-10 lakh	5	Guwahati, Chandigarh, Jammu, Alwar, Kochi
2	10-20 lakh	6	Bhopal, Indore, Ghaziabad, Jodhpur, Ranchi, Amritsar
3	20 lakh & above	8	Lucknow, Kanpur, Surat, Ahmedabad, Kolkata, Delhi, Mumbai, Bangalore

### Existing Scenario

In Indian cities the key role played by IPT are of two types:

- The dominant mode of public transport in smaller and medium-sized cities like Alwar, Amritsar, etc.
- A feeder to the main mode of public transport like metro, BRT, suburban rail, etc) in larger cities like Delhi, Mumbai, Kolkata, and Ahmedabad.

### Composition

The predominant type of IPT vehicles across Indian cities are three-seater autorickshaws (60%), Tata Magic (four-wheeler IPT vehicles with seating capacity of 8 passengers) 24%, and higher grade vehicles and Tempos/Vikram (3 wheeler IPT with a seating capacity of 6-8 passengers) constituting only 16%. Many cities like Delhi, Bhopal, Indore, Alwar are switching to these higher-grade vehicles to comply with the emissions standards of the city.

### Acts and Rules

The existing Central Motor Vehicle Act 1988 and the State Motor Vehicle Rules identify the Regional Transport Authority (RTA) as the registering authority for all vehicles including IPT vehicles. However, there is no institution that can enforce the various duties and responsibilities related to motor vehicles. The act does not detail the method for fixing the routes and fares, use of modern technologies to improve performance of IPT vehicles, mode of financing the vehicles, improvement of socioeconomic conditions of drivers, etc. Therefore, there is a need to revise the existing policy, act, and rules.

### *Permits*

In India, the regulatory authorities for IPT are: 1) the RTA, which issues permits and licenses to the drivers and 2) the traffic police, which is responsible for enforcement of rules and regulations on roads. The documents required for obtaining permits are more or less similar for all cities—application form, residence proof, driving license, fitness certificate, PUC, etc.

It has been also observed that the permit system in India is of two types 1) open permit system, with no cap on the number of permits issued, like in case of Surat and 2) closed permit system, where there is a cap on permits, like Mumbai, Kolkata, Delhi etc. However, the cap on the number of IPT vehicles is ad hoc, resulting in many unauthorized vehicles operating in cities like Kolkata, Lucknow, Delhi, etc.

### *Lack of ownership/institution for the IPT vehicles*

The Central Motor Vehicles Act does not recognise the institution responsible for the discharge of its function and responsibility towards the IPT vehicles, other than the RTA for issuing permits and traffic police for ensuring adherence of rules. This sector is considered to be unorganised and completely privately owned. Therefore, the government doesn't give recognition for organising the system like improving the fleet, financing the vehicles and improving the working and social conditions of the drivers.

### *Routes*

The routes of the three-seater autorickshaws (80%) are usually not fixed for operation by the RTA, except in Guwahati and Kolkata. In case of Vikrams /Tempos (70%), routes are mostly fixed by the unions and the drivers themselves. The lack of proper route rationalisation often results in increased competition between drivers, rash driving practices and disproportionate distribution of services in the city.

### *Fare Fixation*

There are no fixed rules for fixation of fares. In case of three-seater autorickshaws, the fares are fixed by the RTA on the basis of government notification. 70% of the cities do not have a fixed fare system for tempos /Vikrams/ Tata Magic. The fares are decided by the unions and

the drivers themselves. Note that due to a lack of standardised analytical framework for fare determination, implementation, and revision, drivers usually overcharge, and conflicts between drivers, unions, commuters, and authorities are common.

### *Infrastructure Facilities*

In most cities, adequate number of IPT stands, interchange, and parking facilities for the vehicles are not provided. As a result, these vehicles queue along the roadside leading to congestion, especially near the junctions. In some cities like Jodhpur and Ahmedabad, despite notifications from the Nagar Nigam and Municipal Corporation, hawkers often encroach upon the stands and interchange facilities. Also, drivers don't have access to other infrastructures like gas stations, registered repair shops and rest rooms, and shelters.

### *Vehicle Technology and Fuel Type*

The city size does not always define the type or characteristics of IPT vehicles. It has been observed that 64% of the vehicles across Indian cities are 4-stroke, and 2-stroke accounts for only 36% of the total IPT vehicles. 2-stroke vehicle types are mostly found in category 1 and 2 sized cities due to their lower capital and maintenance cost. This also results in high levels of pollution. The predominant fuel type used by IPT vehicles across India is CNG/ LPG (60%). In the remaining 40% of the cities, mostly belonging to category 1 and 2, vehicles use a blend of diesel and petrol, which also leads to greater levels of pollution and greenhouse gas emissions.

### *Use of ITS in Vehicles*

IPT, unlike cabs and private vehicles, do not use modern technologies like GPS, panic button, etc. As a result, these vehicles are usually concentrated in a place where the probability of getting passengers is the highest. Secondly, the traffic police often penalizes the drivers for not wearing uniforms, non-usage of fare meter, violation of routes, lack of documents etc without giving a proper challan to drivers. Thirdly, IPT is not considered safe especially for the females and elderly people as the vehicles cannot be tracked, and finally the drivers often charge illegally as there is no fixed meter system in most cities.

### *Financing of IPT vehicles*

Most drivers rent the vehicles from their owners as they are financially weak and the process of getting loans is not favourable for them. In India, the nationalised banks lend money at 12.5% to 15.5%; however the applicant needs to submit many documents like address proof, pan card, etc. In the absence of easy loans from nationalised bank, most (about 75%) drivers resort to the private banks and money lenders for funding or take the vehicle on rent for operations. These banks have a higher rate of interest (20 to 25%), require fewer documents, and offer a faster procedure for sanction of loans.

### *Socioeconomic Condition of the Drivers*

From the survey, it was observed that about 2/3<sup>rd</sup> of the drivers working in this sector have only completed primary education. Most of the surveyed drivers (70%) operated vehicles on rent. The average rent paid per day by a three-seater autorickshaw driver is Rs 250 and Rs 650 for Tata Magic/ Vikrams. Considering that the average kilometres driven by the drivers in cities are approximately 100 kilometres, the average ridership is 45 passengers/day.

On an average, the driver of a three-seater autorickshaws earns an average revenue of Rs 12,000 excluding the rent. In case of profitable routes, this earning increases to Rs 20,000. However, in case the drivers have to pay rent, the earning per month reduces to Rs 4,250/month, which in case of profitable routes is Rs 12,500. For services operated as shared/shuttle, the revenue earned per month without rent is Rs 15,000 per month, which increases to Rs 23,000 for profitable routes. For IPT vehicles operated on rent, the average monthly revenue reduces to Rs 7,500 and in case of profitable routes to Rs 15,000.

It is observed that nearly 50% of the earnings of a driver goes towards rent. This has a significant impact on the financial status and overall well-being of the drivers. Further, the average maintenance cost of each three-wheeler autorickshaw is Rs 1,700 per month and for Vikram /Tata magic, it is Rs 1,300 per month. Other miscellaneous expenses incurred by a driver are Rs 300/ month. Considering the expenses incurred by a driver on daily maintenance, fuel and rent, the average monthly saving of a driver is Rs 5,000.

This sector being unorganised in India, the drivers work individually. They rarely get any social benefits from the unions or from NGOs. They also don't receive help from the government in the form of training, insurance, medical facilities, pension, education, etc, except for a few social groups. Also to earn their daily wages and to cover the operating expenses the IPT, drivers work for more than 12 hours a day, resulting in constant exposure to pollution and poor health conditions. This also leads to weakness, tiredness, and thus unsafe driving practices.

### *Users Perspective*

From the survey, it has been observed that more or less all age groups of people use the IPT system; however, commuters in the age group of 30-40 years are predominant. The average distance travelled by the passengers is approximately 5.5 kms, with an average spending of Rs 600 per month. Some of the major issues faced by the users are high fares being charged by the operators due to faulty fare meters, absence of dedicated autorickshaw stands and parking areas, which often leads to chaos and congestion on roads, overloading in case of shared services, safety and security issues, especially for female and elderly users, and non-availability of autorickshaw services at night time.

A preference survey was done for drivers and users regarding the improvement of the system including infrastructure like stands, usage of modern technology for improvement of security, fixation of fare structure for IPT, etc. About 80% of both drivers and users believe that such recommendations should be included to upgrade the system.

### **Recommendations**

Some of the recommendations that can be followed by cities to solve the challenges are as follows:

#### **1. Regulatory Framework**

##### **1. Acts and Rules**

There is a need for the review of the Central and State Motor Vehicles Rules. The central act should include the roles and responsibilities of various institutions and standard clauses for



the State Motor Vehicles Rules relating to issue of permits, penalties, time for processing, and documents required. The state rules should also indicate the various kinds of fees to be paid during the issuance of permits. The state can put a cap on the numbers of IPT vehicles plying within the city when issuing permits. Further, route rationalisation and fares revision should also be included in the rules.

## 2. Institution for IPT

To solve most of the problems and the challenges faced by this sector, the IPT services should be organised under the umbrella of an existing Special Purpose Vehicle (SPV) or a new SPV can be set up in case an existing SPV is not available. This will not only organise the IPT services under an umbrella organisation but also reduce any heavy financial burden on the government.

The operations of the vehicles can then be done on Public Private Partnership (PPP) basis. To ensure high-quality service, the SPV can specify the number of permits, routes, fares, technology, emission standards, performance standards, marketing, training for drivers, ITS facilities, etc. for the system, while selecting the operator.

To manage the operations, the SPV must include staff taken on deputation from the government, and recruit others from the open market as the required skills will not be available with any agency of the government. Apart from these, other members who can be a part of this SPV should be the RTA, an engineer from Municipal Corporation who is responsible for the provision of infrastructure, and representatives from the traffic police.

## 3. Permits

To ensure consistency in the issuance of permits, the steps that can be taken include developing a single Motor Vehicle Rule for all states, varying the permit fees for IPT based on the type of route, and fixing the number of permits to be issued by the city. This will ensure that the supply of IPT vehicle meets the demand while controlling the unhealthy competition and congestion on the streets.

## 4. Route Rationalisation

The three options that can be used for route rationalisation are as follows:

- A. To take care of the problem of route rationalisation, two steps may be taken to [develop routes of shared IPT](#). First is the modification of the existing routes in order to delete maximum overlaps and competition and second would be to introduce new routes in areas where IPT is absent. This will help in bringing efficiency and reliability in the system for commuters and reduce competition leading to better earning amongst drivers. This, along with strong enforcement by the traffic police, will also help with proper implementation.
- B. The second option can be [route-wise permit fee variation for the IPT services](#). To end the problem of weak service coverage in a few areas of the city and incentivise the drivers with low financial status, fees may vary according to the demand of areas. The higher the demand of a route, the higher could be the permit fee and vice versa.
- C. The third option that can be adopted is clubbing the profitable routes with the non profitable routes and [developing a cluster system](#) in which operations for certain routes are tendered to private operators, so that every operator in its own cluster has both the routes to equalize the variation in earning.

All these methods are possible only if an SPV is set up to regularise IPT operations.

## 2. Infrastructure Facilities

The suggestions for improvement are as follows:

- Halt and go facilities should be developed along the roadside, and interchange facilities should be created near bus stands and metro stations depending on the demand of passengers and the surrounding location.
- Parking areas should be identified for the drivers to safely park their vehicle at night for a payment. The same area should also be provided with common repair and maintenance facilities.

- New auto stands with various amenities like rest shelters, drinking water, and toilet facilities should be created to improve the working conditions of drivers.
- Gas stations should be set up.
- There should be strict enforcement for regulating the stopping and halting of IPT vehicles near intersections. A minimum distance of 250 meters from the intersections/junctions should be observed for restricting the stopping and halting of IPT.

### 3. Technological Upgradations

To solve problem of outdated technology and to meet emission standards the following suggestions are made:

- To replace the old polluting vehicles plying on the roads, the government needs to provide financial incentives such as sales tax exemption and interest subsidy on loans, for retrofitting latest technologies. A few cities like Delhi, Bangalore, Kolkata, Chennai, and Hyderabad have already taken the lead in this. As a fiscal incentive for CNG/LPG conversion, the city government provided a subsidy of around Rs 2,000 to three-seater autorickshaw owners.
- With the financial incentives from the government, the drivers and manufacturers must be encouraged to upgrade their IPT vehicles to 4-stroke and BS IV standards (to be launched in 2015).
- Regulatory measures should be put in place for the creation of a single nodal agency specifying the standards and norms, keeping in mind the latest technologies of vehicles and adoption of separate emission standards for HC and NOx emissions, and defining CO2 emission standard. To implement the emissions legislation set up by the Ministry of Road Transport and Highway (MORTH), the state governments should restrict the age of IPT vehicles to a maximum of 8 years, so that it runs in good condition.

- Other measures include setting up of more CNG/LPG stations and more research into alternative fuel and vehicle technology to lower the cost of the vehicle.

The use of modern ITS technology could significantly upgrade the service and solve many issues like unequal dispatch of vehicles, security to passengers, enforcement by traffic police, and overcharging by drivers from the commuters. Some of the measures are as follows:

- For more efficiency, the various components of ITS can be implemented in two phases. In phase 1, the panic button and GPS can be installed on the vehicles along with a Traffic Management Centre to monitor the movement and dispatch of vehicles. The autorickshaws may also be installed with “hired/vacant” panel (status panel), and E-challan may be introduced. Phase 2 can consist of the implementation of the Passenger Information System (PIS), Security Camera, and smart card reader.
- For installation of the ITS devices on existing vehicles, subsidy may be provided by the state/ city government to the owners of these vehicles to partially meet the cost of GPS/GPRS. It could be similar to the case of Delhi NCR where having a GPS is mandatory to get a fitness certificate. All new vehicles can be pre-installed with ITS devices and the government may define the specifications for them as has been done for urban buses in India.
- The control centre can be set up on a PPP basis where the private party can recover its cost every month through the extra transaction cost that can be charged to the passengers along with the fares. A similar system has already been implemented by G-Autos in Surat, where Rs 20 is charged as the transaction fee. Alternatively, the existing control room for the public transport system can be integrated with the IPT vehicles.

#### **4. Economic/social stability for drivers**

To bring economic stability the following recommendations are made:

- The maintenance cost can be lowered by providing the drivers a shared repair workshop and training them to do the basic repairs to avoid a trip to private workshops for minor repair work.
- To increase the revenue for the drivers, other options like advertisements, renting the vehicles for rallies, schools, the tourism department, etc. can be explored in various cities.
- To solve the problem of financing the IPT vehicles for the drivers, the most appropriate option would be institutionalising the services under the umbrella of an SPV and tendering the operations of the vehicles on PPP. The drivers can form a consortium and bid for the services. The finances would be much more easily available to the consortium as compared to individual drivers, as they will be known by the SPV/ government. Besides, there will not be any risk of a sudden shortage of funds or closing down of companies; therefore the system would continue to work regularly and provide economic stability to drivers.
- The average savings of an IPT driver is less than Rs 5,000 per month, i.e. about Rs 170 per day. The Minimum Wages Act, 1948 has stipulated fixation and enforcement of minimum wages in the country. As per the act, the average monthly wages of a semi-skilled labour works out to be approximately Rs 9,000. The existing earnings of an IPT driver are far below this level and do not provide him with enough resources to provide education for his children or ensure good health of his family.

If the minimum wages are considered as savings after excluding the expenses incurred by a driver (which includes rental to be paid, operation and maintenance cost and other miscellaneous cost), the fare per kilometer works out to Rs 9.2 for three-seater autorickshaws and Rs 2.3 for Tempos and Tata Magic (based on 2013-2014 prices).

The existing fare across most of the cities, except in metropolitan areas, is less than the expected fare. It therefore calls for revision of fare in most cities. Also, this fare will need to be reviewed periodically—say quarterly or biannually—to reflect the changes in fuel price or wage rate.

Based on the above calculations, the proposed fare fixation formula for autos is as follows:

$$\text{Fareperkm} = 2 * [(0.07\% * CV) + \left(KM * \frac{FC}{FE}\right) + (0.26 * W)]$$

The proposed fare fixation formula for Tempos/ Tata Magic is as follows:

$$\text{Fareperkm} = 1.6/P * [(0.07\% * CV) + \left(KM * \frac{FC}{FE}\right) + (0.21 * W)]$$

Where:

CV = Capital cost of the vehicle

KM = Average Kilometres operated per day

FC = Cost of Fuel

FE = Fuel Efficiency the vehicle

P = The average occupancy the vehicle

W = minimum daily wages as per Minimum Wages Act, 1948

- For the provision of social benefits to drivers, the government/SPV/private bodies/NGOS/ unions of IPT vehicles must spread awareness and educate the drivers and advise them to become a part of the schemes provided by the Government like Janta Personal Accident Insurance promoted by New India Insurance Company, free medical check-ups at various government hospitals for the drivers and their families, Swavalamban Pension Scheme provided by Pension Fund Regulatory and Development Authority, and Sarva Siksha Abhiyan, free education for school children. Adult education should also be promoted for the drivers through Government/NGOs/ private bodies/ SPV for example.

## Conclusion

The use of IPT vehicles is extensive in Indian cities. They are not only operating in small and medium sizes cities but even in popular large cities as they provide mobility at low cost to a large section of the society. While in small and medium cities they act as the public transport system, in larger cities they act as a feeder service to the existing public transport.

However, in spite of the important role that IPT plays, there are various issues/challenges related to the sector. To solve most of the problems faced by this sector, [organising the IPT under the umbrella of an existing SPV or setting up a new SPV](#) (in case an existing SPV is not available) is most suitable as it would organise the existing/ new IPT services and reduce any financial burden on the government.

## 1. BACKGROUND

India is witnessing rapid urbanisation and motorisation; the urban population is growing at a rate of 3.16 % per year, motor vehicles are growing at a rate of 9% (Source: Sharma, Jain, and Singh, 2011). This is owing to the lack of public transport supply in cities. Today, buses constitute only 1% of the total registered vehicles in cities<sup>1</sup>. In fact, a few Indian cities have organised, regularised, and regulated public transport system<sup>2</sup>. The commuter rail service is also limited to a few metropolitan cities. In the absence of an organised city bus service, the intermediate public transport (IPT) modes such as three-wheeler autorickshaws, tempos and Tata Magic etc<sup>3</sup> are filling the gap.

Within the urban transport framework, IPT contributes to meeting daily mobility needs with 3-8 % of the daily urban trips in Indian cities (Figure 1-1).

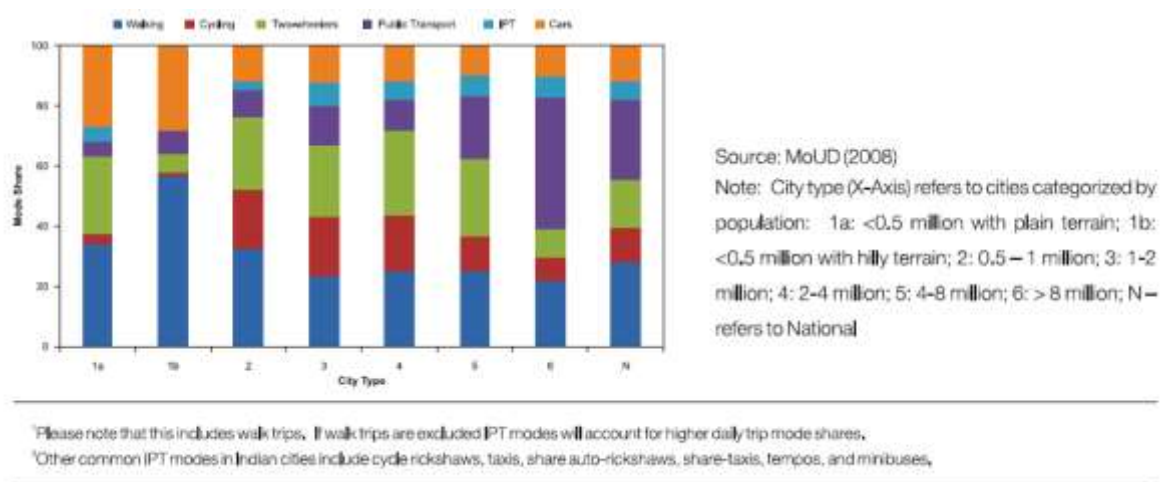


Figure 1-1: Modal Split of Indian Cities

According to an MoUD study conducted in 2008, it has been observed that para transit index (number of IPT vehicles for 10,000 population) is higher in cities without public transport and lower in cities with public transport. (Figure 1-2).

<sup>1</sup> Source: Road Transport Yearbook 2011-12, Ministry of Road Transport and Highways

<sup>2</sup> Source : NTDPC report, 2014.

<sup>3</sup> Source : NTDPC report, 2014.



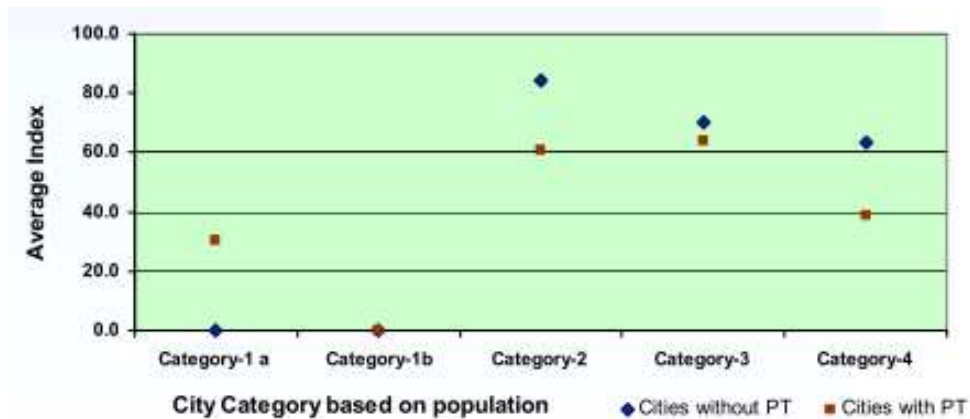
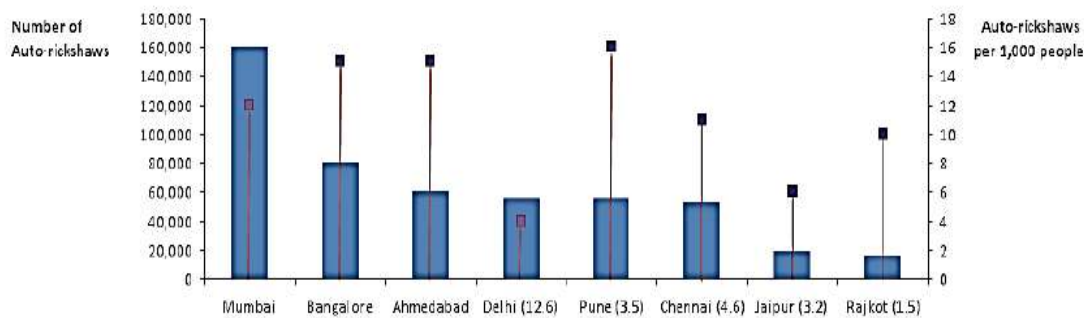


Figure 1-2: Impact of Public Transport on IPT Index

Therefore, from the study of the IPT index (MoUD, 2008) three roles of IPT have been clearly defined. They are as follows:

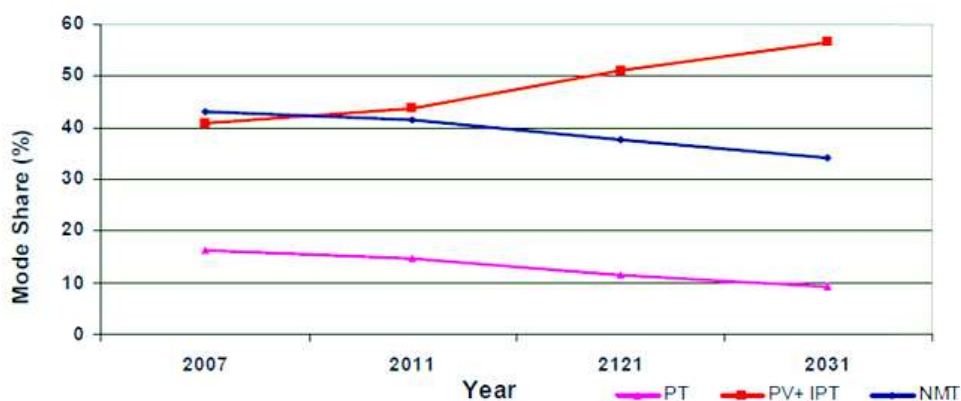
1. In large cities with the presence of various kinds of public transport like Delhi, Kolkata, Mumbai, IPT is used as a feeder service to provide first and last mile connectivity to mass rapid transit like buses and train.
2. In smaller cities, it acts as the main mode of public transport.
3. In cities where organised mass rapid transit is provided only in some parts of the cities like Surat, Rajkot, etc., it plays a dual role—both as a feeder to mass transit and as public transport in some parts of the city.

Based on population statistics, it is estimated that Tier I and II cities have 4 to 16 IPT vehicles serving every 1,000 people (Figure 1-3), which implies that a significant number of people in Indian cities rely on IPT services for most of their trips.



**Figure 1-3: No. of IPT Vehicles in Selected Cities per 1,000 People (Source: WRI, Sustainable Urban Transportation Policy brief)**

In recent times, it is found that due to the deteriorating quality of public transport and NMT (walking, cycling), the mode share is declining (Figure 1-4). Commuters from middle and high-income groups are switching to private vehicles and the urban poor prefer to use IPT as an alternative mode to fulfill their travel needs. This trend is expected to continue. (Source: WRI and Embarq, 2011)



**Figure 1-4: Future Trend of Mode Share in Indian Cities (Source: MoUD, 2008).**

IPT serves the daily mobility needs of only 3-8% of the daily urban trips in Indian cities. But due to the numerous important roles these vehicles play in various cities, there is a growing shift from public transport users to IPT. Thus, it can be concluded that IPT is considered to be one of the most important modes of transport in Indian cities.

## 1.1 Need for the study

Recent policy initiatives by the Central government, such as the 2005 Jawaharlal Nehru National Urban Renewal Mission (JnNURM), a Central government financial assistance program for urban infrastructure projects and the National Urban Transport Policy (NUTP) 2006 aim to provide a vision and framework for promoting sustainable urban transport in India. However, the till date analysis of JnNURM projects, undertaken by cities, indicates that no projects related to the improvements in IPT services have been proposed/sanctioned (JnNURM Projects, 2011). The NUTP 2006 also envisions the primary role of IPT as a transportation mode that serves “occasional trips such as trips to airports or rail stations with excessive baggage, or emergency trips that have to be undertaken immediately when it is not possible to wait for public transport”.

**The recommendations of the working group on urban transport both for the 12th Five-Year Plan and the NTDP stress the need to improve the IPT Services; while the former states that there is a need to “improve and upgrade Intermediate public transport vehicles and services” (para 15.5.1). The NTDP states that “Intermediate Public Transport have a potential of providing clean mobility, low emissions, and improved safety. Manufacturers should be encouraged to invest in improving the technology of these vehicles”. (Annexure I para 8)**

The report further recommends that studies are needed to “Upgrade Intermediate Public Transport”.

Therefore the need for the study arises to improve and upgrade the IPT vehicles and services, recognizing the important role they play in the Indian cities.

## 1.2 Objective of the Study

The objective of the study is to develop an action plan to Improve and upgrade IPT vehicles and services.

## Scope of the Study

The broad scope of the study is as follows:

1. Literature review of existing situation analysis of IPT system in Indian cities
2. Organisation and regulation of IPT services and provision of infrastructure facilities
3. Scientific management of IPT with the help of ITS
4. Improvement in vehicle technology and setting up emission and safety standards
5. Plan for financing the Improvement and upgrade of Intermediate public transport vehicles and services

The detail scope of work along with task for each scope is identified below:

**1. Literature review** is important to understand the existing IPT system in Indian cities, its permit, fares, routes, etc. and the existing gaps in the systems. Also a review of some of the initiatives taken by other countries and cities of the world has been done to draw key learnings for the improvement of Indian cities.

**2. Organisation and regulation of IPT services and provision of infrastructure facilities**

For this purpose, the following tasks need to be performed.

**Task 1:** Study the present operations of IPT in a representative sample of 19 Indian cities to understand:

- a. The permit system,
- b. The existing fare system,
- c. Route pattern-fixed or not fixed,
- d. Operational characteristics,
- e. User characteristics and user perspective,
- f. Operators perspective,
- g. A government perspective,
- h. Vehicle maintenance,
- i. Infrastructure provision,
- j. Financing system, and

k. Social benefits.

**Task 2:** Based on the study of 19 cities, identify issues in the IPT services.

**Task 3:** Determine ways and means of organising the existing services to improve efficiency and working conditions for operators.

**Task 4:** Define Infrastructure requirements.

**Task 5:** Install an institutional mechanism and policy for IPT operation and monitoring.

### **3. Scientific management of IPT with the help of ITS**

For scientific management of IPT, the following tasks have been identified:

**Task 1:** Identifying issues and need from existing system for fitment of ITS on IPT vehicles

**Task 2:** Identifying components for fitment in IPT vehicles

**Task 3:** Developing an implementation plan for fitment of ITS

### **4. Improvement in vehicle technology and setting up emission standards**

The following are the tasks undertaken for this objective fulfillment:

**Task 1:** Study the current vehicle technology and emission standards for IPT vehicles.

**Task 2:** Identify issues and need for improvement in vehicle technology and setting up emission standards for IPT vehicles.

**Task 3:** Identify the future plan of action.

### **5. Plan for financing the improvement and upgrade of IPT vehicles and services**

**Task 1:** Study the alternatives to financing the IPT vehicles.

**Task 2:** Identify the most feasible option for finance.

## Methodology

The methodology for the study can be broadly divided into three broad categories as follows (Figure1-5)

1. **Stage I: Literature Review** –In this stage the basic challenge related to Indian Transport scenario and the important role of IPT in Indian cities is focused on. Also emphasis is laid on understanding the term IPT, its typologies, benefits, vehicle characteristics, policies etc. This stage also involves the identification of the need, objective, and scope of the study.
2. **Stage 2: Field Visit**- This stage involves the preparation of a questionnaire and a field visit for understanding the current situation on the ground. 19 cities (Table 1. 1) covering north, south, east and west of India have been selected based on its population size for the study. The selected sample of cities is as follows:

**Table 1-1: List of Cities Selected for the Study Along with their Population**

Serial Number	Population size	Number of cities	Name of the city
1	5-10 lakh	5	Guwahati, Chandigarh, Jammu, Alwar, Kochi
2	10-20 lakh	6	Bhopal, Indore, Ghaziabad, Jodhpur, Ranchi, Amritsar
3	20 lakh and above	8	Lucknow, Kanpur, Surat, Ahmedabad, Kolkata, Delhi, Mumbai, Bangalore

After the selection of cities, three kinds of questionnaire are prepared to get feedback from:

- Government officials – RTO, Traffic Police,
- Operators /drivers/ unions, and
- Users on the services of IPT in various cities.

In case of the primary users and operator survey a sample size varying in between 0.1% and 1%, depending on the total number of registered IPT vehicles in the city, is considered for the study. The data collection process is followed by an analysis of IPT's roles in various cities and identification of the major issues and problems related to its operations and services.

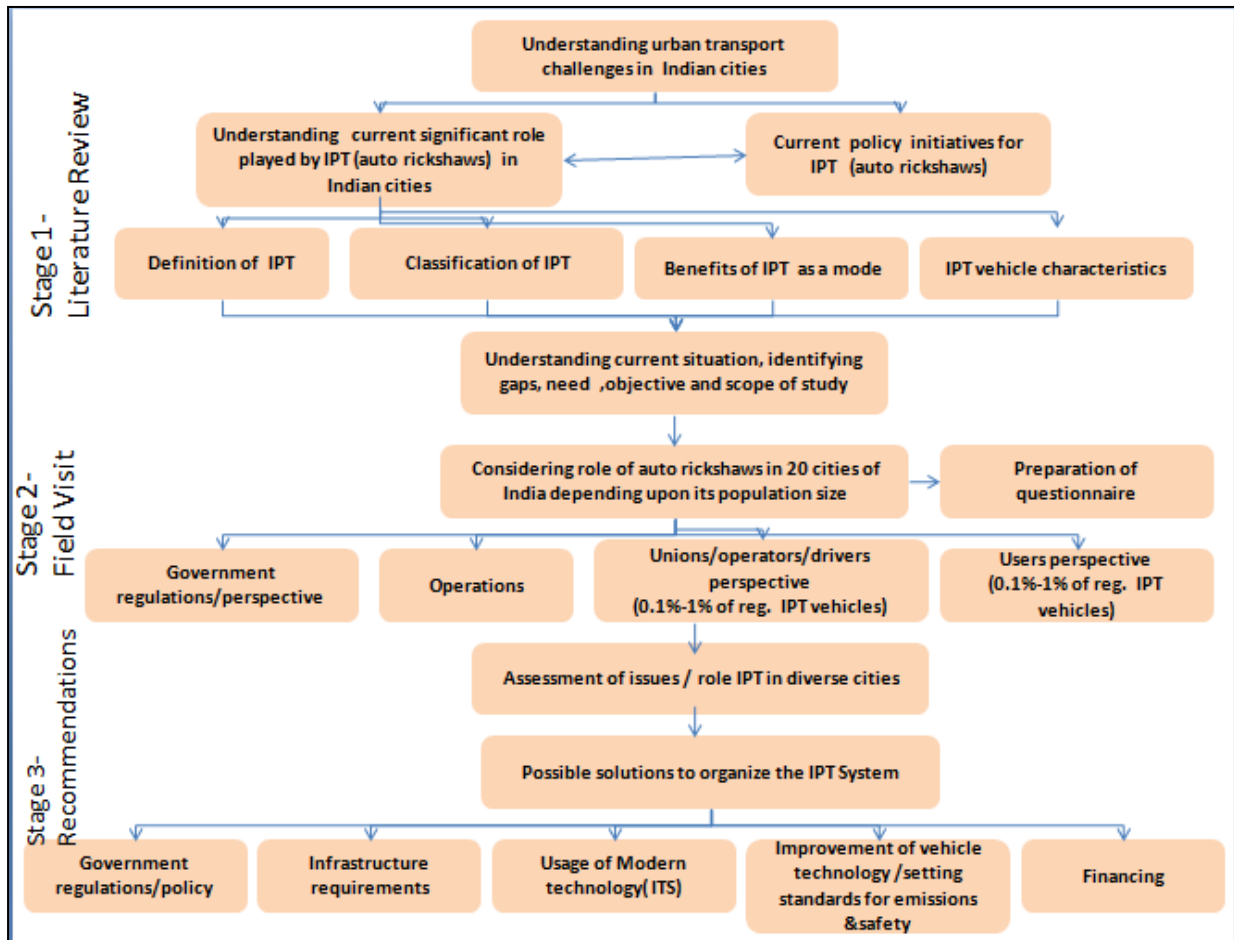


Figure 1-5: Methodology of the Study

**Stage 3: Recommendations-** This stage involves the final conclusions and recommendations to upgrade the operations and services of IPT. The recommendations have been broadly categorized under the following heads:

- Government regulations/policy
- Infrastructure requirements
- Use of modern technology
- Improvement of vehicle technology and standards
- Financing

## 1.4 Limitations of the Study

Following are the limitations of the study:

1. **The study only focuses on motorized IPT – private and shared three-seater autorickshaws and shared seven-seater tempos and Tata Magic.**
2. The report is based on observations and conclusions drawn from the interview of government officials like RTOs, traffic police, auto unions/operators and users of different cities.

## Report Structure

- **Chapter 1** gives a brief about the background of the project, objective, and the scope of study.
- **Chapter 2** gives a brief about the concepts about Intermediate Public Transport—its types and the benefits.
- **Chapter 3** gives the best case studies dealing Intermediate Public Transport system in cities of developed and developing countries.
- **Chapter 4** gives a detailed analysis of the 19 cities in India in which the surveys covered various aspects of IPT like its role, fares, routes, drivers and user's perception.
- **Chapter 5** gives a brief about the issues and observations related to the IPT system.
- **Chapter 6** gives an insight into the existing IPT vehicle technology and emission standards.
- **Chapter 8** deals with the main recommendations in relation to the issues faced by the IPT sector in Indian cities.
- **Chapter 9** deals with alternative scenario development for financing the IPT vehicles.
- **Chapter 10** deals with the institutional framework needed for IPT vehicles.
- **Chapter 11** gives a brief conclusion to the study.



## 2. INTERMEDIATE PUBLIC TRANSPORT: CONCEPTS

### 2.1 Introduction

According to the “Study on Traffic and Transportation Strategies in urban areas in India, Wilber Smith/MoUD 2008”, Intermediate public transport (IPT) refers to the mode of travel falling in between traditional public transport and private automobile in cities. The major difference between public transport, IPT and private modes are as follows:

**Table 2-1: Criteria for Different Modes of Transport**

S.No.	Criterion	Public transport	Intermediate transport		public	Private transport
			Auto-rickshaws	Tempos (shared)		
1.	Fixed Route	✓	×	✓		×
2.	Fixed Schedule	✓	×	×		×
3.	Fixed Fare	✓	May/may not	May/ may not		×
4	User –one among many/access to all	Accessible to all	For personal trip	Accessible to all	For trip	For personal trip

### 2.2 Classification of IPT modes

Depending on a city’s size and transport characteristics, IPT modes may fall under two broad categories: 1) contract carriage services, which are flexible demand-based services where the passenger determines the destination and 2) informal public transport (bus like) services, characterized by a shared, fixed route with intermediate stops for boarding and alighting. (Figure 2-1). While contract carriage services are ubiquitous in cities, informal public transport services are typically seen in small and medium-sized cities, which may not have any or adequate formal public transport services—though in some cases metropolitan cities like Kolkata also have this informal bus-like services. Such services are called informal because of their ownership structure (individual owners) and lack of (or poor) regulation and enforcement.

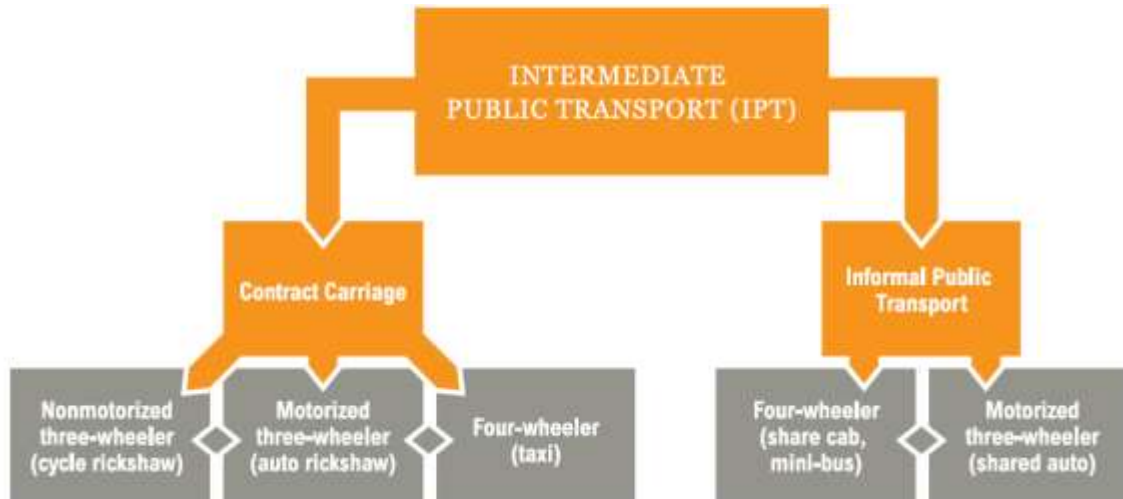


Figure 2-1: Classification of IPT modes According to WRI, Embarq

The concept of IPT, however, differs between developed and developing countries. In developed countries, IPT is often used for demand responsive systems such as shared-ride taxis, dial-a-ride, and subscription buses. In developing countries, however, lower standard of living, high population density, and easy availability of cheap labour, etc., together generate a demand for a variety of transport modes, fulfilling the gap between public transport and private vehicles.

Various forms of IPT modes exist in cities world over and in India, ranging from simple non-motorized human or animal-powered vehicles to motorized mini buses; the motorized IPT modes are dominant in most of the Indian cities like Kanpur, Jaipur, Lucknow, etc. They provide flexible and frequent services to small settlements through narrow streets, where no other service is available at a relatively low fare.

IPT system can be broadly classified into two types: non-motorized and motorized. Motorized IPT can be further sub-classified into three groups based on their seating capacity. (Shimazaki & Rahman)

#### ***Individual Type (seating capacity less than 4)***

Autorickshaws, ojek, becak, etc. are individual type IPT with different names for the same vehicle world over. These vehicle types usually operate as privately hired or offer contract carriage services, providing connectivity from one point to another. Sometimes, they

operate as a shared vehicle also, such as autorickshaws operating on three passenger shared system. Incredibly, some three-wheel scooters, like Dhaka's auto-tempos, seat as many as nine passengers.

### *Shared type (seating capacity 4-10)*

Shuttle autorickshaws, tempos, GraminSeva, minivans and minibuses such as, Angkots, Kombis, Jeepneys, etc. comprise the shared type IPT. These vehicles, mostly ply on fixed / semi-fixed routes, as per the passenger demand. They function principally as distributors and feeders, moving people from their residences to main PT routes and terminals. Often, they are found competing with formal PT systems, since the unsubsidized and largely unregulated IPT are more market-responsive and cost-effective than the subsidized and more tightly regulated PT systems

### *Collective type (seating capacity 11 - 20)*

Collective type IPT comprises of Jitneys, Matadors, Kombis which are minibuses and sometimes station wagons that operate along fixed routes, with fairly loose timetables. They usually pick up and unload passengers anywhere along the route. Examples include Manila's Jeepneys, Pretoria's Kombis, Surabaya's Angkot, and Kuala Lumpur's Bas Mini. In most instances, these services largely compete with, rather than complement, formal public transport services. In terms of service features, they are midway between conventional buses and the more "primitive" forms of IPT like motorized three-wheelers. Their willingness to collect and discharge passengers anywhere along a route distinguishes jitneys and other carriers from conventional buses, though this customer benefit is at the expense of non-customer drawbacks—in the form of mid-lane stopping and blocking traffic.

**In case of India, among the above three categories, individual and shared type are more prominent and would be the focus of this study.**

## **Benefits of IPT as a Mode**

IPT plays many roles in providing its services and also has benefits to offer, if organised, in our current transportation system.

- 1. Mobility and Connectivity:** The chief benefit of informal transport is that it provides the much-needed and much-valued mobility to reach commercial, educational, recreational, and residential and other destinations by providing end-to-end mobility to people who need connectivity to these destinations. IPT provides indispensable services in places where bus services are irregular, unreliable, or non-existent. IPT vehicles often ply routes and enter neighbourhoods that are inaccessible by buses. Also, during night shifts, when buses are no longer running, IPT vehicles sometimes are the only means of getting around. In the case of Mexico City, for example, the heavily subsidized, the low-cost Metro rail system does not reach most suburbs on the outer edges of the city. A swarm of collective-minibuses have filled the service gap, providing connectivity between Metro terminuses and outlying residences. Unlicensed commuter vans and autorickshaws in cities today directly compete with formal bus services, providing consumers with a wider choice of mobility options — notably, travel-time savings and guaranteed seats in return for premium fares.
- 2. Source of Employment:** IPT is a source of employment for thousands of unskilled and less educated people worldwide. This sector generates a considerable number of employment opportunities, sometimes as much as 10-20% of the total employment in some cities (Source: Rahman T.S)
- 3. Complementarity:** IPT is often used by commuters as they provide feeder connections between the job point of origin/destinations and trunk routes at low cost. IPT aids public transport operators by improving connectivity as well as offloading high-cost services. Thus IPT not only operates in the absence of a formal PT system but also as a supplement and as a flexible complement to them.
- 4. Efficient Low-Cost Services:** IPT is definitely resourceful and cost-effective. Hard work and straightforward services keep the costs low. Choosing a route for maximum earning and maintaining the frequent passenger turnover both ensure increased patronage for IPT drivers.

These vehicles require less space for parking as compared to private vehicles and can carry more passengers per trip. Owing to their smaller size, IPT consumes about one-

third of the national resources in their production compared to private cars. Their lower capital costs in production and operations also make IPT vehicles as a low-cost transport option for lower and middle income class population. Also, due to their lower weight and slower speeds, these modes cause less wear-and-tear of roads as compared to cars and other heavy vehicles.

- 5. Market Responsive:** IPT vehicles serve according to the market demands, and hence they tend to be flexible in terms of the passenger's needs and demands. They easily alter frequencies, rates, timings, and their operations resulting in favour of the market demand. This characteristic of IPT vehicles is one of the major attracting features that enable them to get passengers who prefer IPT over public transport.

## 2.4 Regulations

At the national level, Ministry of Road Transport and Highways (MOTH) is responsible for setting standards for motor vehicles in India through the provisions of the Central Motor Vehicles Act 1988 and Central Motor Vehicles Rules 1989.

Using the provisions of these acts and rules, the transport department of respective states directly regulates motor vehicles in cities. The RTOs of the transport department exercises regulatory powers over driving licenses, motor vehicle registration, permits, and motor vehicle compliance with safety and emission standards. The Traffic Police is also responsible for framing the rules and regulations related to the IPT operation on roads.

## 2.5 Conclusions

IPT refers to the mode of travel falling between traditional public transport and private automobiles in cities. The benefits of IPT as a mode are: mobility and connectivity, source of employment, market responsive services, complement to the public transport and low cost. Depending on a city's size and transport characteristics, IPT modes fall under two broad categories 1) contract carriage services and (2) informal public transport (bus-like services). Various forms of IPT modes exist in the cities world over and in India. In India, the individual and shared types are more prominent and the regulatory bodies for these modes are the Regional Transport Authorities and the Traffic Police.

### 3. CASE STUDIES

#### 3.1 Organising the Informal Economy: A Case of the Minibus Taxi Industry in South Africa

##### *Introduction*

South Africa is located at the southern tip of Africa and has a population of 51 million people of diverse origins, cultures, languages, and religions. The Department of Transport is responsible for regulation of Transportation in South Africa, including public transport, rail transit, civil aviation, shipping, freight, and motor vehicles. Public Transport is mainly represented by buses, with many long-distance services running at night. The buses are quite old, but the network is reliable and reasonably comfortable. Minibus taxis also run everywhere. Most accommodate 14 to 16 people. Many also rely on two-wheelers.

IPT in South Africa is represented by Kombi minibuses (Figure 3-1). The minibus-taxi industry in South Africa caters to approximately 65% of daily commuters. This market share has steadily increased over the last 20 years, as rail and bus services have deteriorated. The minibus-taxi industry at first catered to the mobility needs of people and attracted township dwellers as it offered almost a door-to-door service to commuters.



Figure 3-1: Kombi Minibus—South Africa

The first minibus-taxis were issued with permits of operating at a 30 km radius that allowed operations much on the same principles as that of metered taxis, with operators charging a single fare for an individual or group of passengers. Operators soon started to charge individual fares, which was technically illegal. Commuters, however, were prepared to pay individual fares for the door-to-door services that the new minibuses offered. These services were at first much more economical and convenient than the Government-owned bus services. As the number of minibuses grew, however, competition for passengers and the most lucrative routes increased. This competition for passengers and routes led to minibus-taxi owners forming voluntary associations as a protective measure to restrict competition

on routes and areas that such groups would claim as their own. The traffic authorities were in some cases powerless to enforce the agreements signed for control over the routes because radius permits authorized an operation from a rank within a defined radius – along any route. (Ahmed, 2002)

### *Issues*

In November 1994, soon after South Africa's first democratic election, the then Minister for Transport established a National Taxi Task Team (NTTT). The mandate of the team was to investigate all problems and issues in the industry and formulate solutions to ensure industry sustainability and competitiveness. Initially, the NTTT comprised of nine provincial representatives of owners in the taxi industry, nine government representatives, and nine specialist advisors. Later, organised labour was also asked to participate, and invitations were sent to the three trade union federations. (Barret, 2003)

The main issues raised by stakeholders in the industry, as well as by members of the public at the hearings were related to the following:

- Permits and the role of the Local Road Transport Boards who were perceived as uncooperative and obstructive
- Subsidies for public transport, with the taxi industry complaining bitterly about the levels of subsidy allocated to the bus and train sectors
- Financial problems, including the high costs of replacement of vehicles and the difficulties faced by commuters in meeting an increase in fares
- Law enforcement
- Ongoing violent conflict
- Safety
- Training
- The fragmentation of owners' associations
- Poor conditions of employment
- Problems with transport infrastructure, such as roads and taxi ranks

NTTT concluded that:

- The self-regulation of the industry had failed,
- There was a surplus of permits, and many of them false or duplicated,
- The industry was highly fragmented with no single national association to represent its needs,
- There was an acute shortage of skills ranging from business and negotiation skills to customer relations and even driving, and
- Vehicle maintenance was haphazard, and there was a lack of knowledge about aspects of safe practice (e.g., most vehicles were operating at tyre pressures that were too low).

### *Solutions/Initiatives*

Since 1995, these conclusions have been pursued by the National Department of Transport (DOT) in conjunction with the Department of Labour (DOL) and the Department of Trade and Industry (DTI), as described below.

1. **Taxi recapitalization:** The most significant step relates to the recommendation of the NTTT to introduce new, safer, and larger vehicles into the system. These would be fitted with electronic fare collection systems that will benefit the owner as well as the customer.

It was proposed that the EMS devices will be designed to work with a passenger debit card system, making cash transactions obsolete. Passengers will need to purchase a debit card at an outlet prior to boarding and “swipe” the card on entering the taxi. The EMS device will also record information such as fuel consumption and stops and starts. It will also be linked to a weight gauge and will cut the engine in the event of vehicle overloading

2. **Registration of minibus-taxi operators:** The NTTT had recommended the establishment of offices of Provincial Taxi Registrars. The provincial Registrar would be responsible for the registration of minibus-taxi associations, their members, and



the vehicles that these members operate. The Registrar would also keep a record of the routes or areas where associations are legally permitted to operate. The Registrar would be appointed by the Provincial Minister of Transport and would be defined as an autonomous institution—not subject to the reporting lines of Government departments.

3. **Training and empowerment:** As part of Government's commitment to empower the minibus-taxi industry, the provincial DOT needs to fund the setting up of and administrative assistance to a provincial taxi office. The taxi office would be responsible for coordinating training initiatives in the industry and providing administrative support to democratically elect regional and provincial taxi councils.
4. **Driver benefits:** In September 1999, the Minister of Labour published a government notice inviting public comment on employment conditions in the taxi industry. There were three specified terms of reference for the investigation.
  - Conditions of employment, including a minimum wage
  - The definition of small, medium, and large enterprises in the industry
  - The regulation of pension, provident fund and other benefits
5. **Legislation:** Prior to South Africa's first democratic election in 1994, the transport legislation did not make a provision for minibuses as legal public transport vehicles. The Road Transportation Act 74 of 1977 made an allowance only for metered taxis and buses.

In December 1996, the Western Cape promulgated its Western Cape Road Transportation Act Amendment Law, Law 8 of 1996. This piece of legislation firstly made a provision for a legal definition of a minibus-taxi service. The new Act also required that associations and operators register themselves with the Provincial Taxi Registrar and that they sign a constitution and Code of Conduct.

The Provincial Minister for Transport and Public Works also promulgated a regulation, which required that all new permits would be issued for routes only and that taxis would be clearly marked to firstly identify them as legal operators and secondly to identify the route or network of routes on which they are allowed to

operate on. In terms of the new legislation, permit holders were required to convert their radius-based permits to route- or network-based ones. This provision was at first met with suspicion, but by the end of 2002, 95% of all radius-based permits had been converted to route-based permits.

The organising and formalising of Kombi minibus industry in South Africa looked more at policy-level interventions and the role of authorities to create a more enabling environment for the Kombis. This system helped the South African government to improve operations and to regularise the industry. (Source: Ahmed, 2002 and Barret, 2003)

### 3.2 Organising and formalising methods to Integrate IPT in medium and small-sized cities in Indonesia

#### 3.2.1 Background

With a population of 247 million people, Indonesia is the world's fourth most populous country. Indonesia's transport system has been shaped over time by the economic resource base on this archipelago of islands. Road Transport is predominant, followed by a railway system, sea transport, and air transport. Bus services are available in most areas connected to the road network. In more remote areas, service is provided by minibuses and minivans. There are two basic types of services operating in the cities. First are the formal public transport services like the city buses and second are the informal modes of transport such as angkots, Becaks, and ojek which that are independently run by their owners. (Source: CDIA, 2011).

**Angkot:** Angkots (Figure 3-2) are typically minivans. They are considered to be the formal mode of IPT, but their pattern of operation is informal. They have no designated or pre-determined stops and hence they pick up and drop passengers from any point.



Figure 3-2: Angkots

**Becak:** Becak (Figure 3-3) are pedicabs with a covered seat in front and are powered by the driver with bicycle peddles. They are the slowest moving mode of IPT. Becaks are a permitted mode of transportation, but drivers do not have a license.

**Ojeks:** Ojeks (Figure 3-4) are motorcycles that usually carry one passenger. Overall, Ojeks carry a smaller share of passengers than Angkots, but they are much more numerous. These Ojeks are not licensed to operate as commercial transport vehicles and thus their operations are considered informal.

All these IPT modes are highly preferred by the urban poor, middle income group, shoppers, business

owners, and students for the following reasons:

- Provides close connectivity to employment centres, markets,
- Convenient,
- Perceived to be safer than public buses,
- Can load goods,
- Available at late nights, and
- Can work with one driver on contracts.

### 3.2.2 Issues

A large number of these IPT vehicles have resulted in a competition amongst the drivers to increase their patronage and the revenue. The patronage of these vehicles has been reduced over time as people prefer to travel by private vehicles, especially motorcycles, as they are faster and more convenient. Also, the vehicles have a low roof and door height, making it difficult for the passengers to alight and board the vehicle, thus leading to discomfort. The inappropriate design of the vehicle has also contributed in reducing its



Figure 3-3: Becak



Figure 3-4: Ojeks

popularity. As a result of the declining patronage of these vehicles, the drivers have resorted to unsafe driving practices, which lead to congestion and safety issues.

### *3.2.3 Solutions/ Initiatives*

To organise, integrate, and improve operations, the drivers of these IPT vehicles have themselves taken initiatives, with support from the government, to improve their operations. Some of the key steps taken to organise and integrate these IPT modes are as follows:

1. The IPT modes operate as driver co-operatives, supported and monitored, though not regulated by local government.
2. Each driver is given an ID card, issued by the government, which is registered at the local police station. Though it is not an official card, the initiative is supported by the police department, as having a relationship with drivers is in their interest to see what happens on the street.
3. IPT drivers are organised in cooperatives called “ranks”. Ranks can be formed through a variety of means, ranging from government recognition for sharing of uniforms among the rank members, etc. These ranks are often sponsored by hotels and other businesses that provide exclusive services to their customers. Sponsorship secures a market for drivers.
4. The Ojek drivers wear matching uniform. This enables them to be easily identified by the passengers.
5. Infrastructure facilities such as parking, signages, stops were developed to guide the passengers and also reduce chaos and conflict amongst IPT drivers. Intermodal transfers occur between buses and Angkots and BRT and ojeks as well as between two informal modes such as ojeks and Angkots. Most of the time, these transfers are made in improvised places since there is little or no formally designated space for transfers between formal and informal public transportation.

Transportation facilities such as BRT step ladders, signage, parking rails, Ojek and Becak helmets, and Becak lane were provided, which created lesser confusion and reduced encroachments and chaos, arising due to drivers in congested areas seeking potential passengers.

6. Drivers at important locations such as stations, intermodal changes, commercial centres, markets were provided with ranks (cooperative). This enabled them to use the facilities such as stops, which in turn helped them in getting more passengers in comparison to drivers who did not associate themselves with the ranks. This provision of ranks makes them more responsible and organised.

The organising and formalising of the IPT system in Indonesian cities looked at more of improving infrastructure facilities and organising through a cooperative that helps to achieve efficiency in their operations.

## **Dolmus in Turkey**

### *Introduction*

Turkey, with a population of 74 million inhabitants, has a number of public transport options. It includes local trains, underground services in a number of towns including Ankara, Istanbul, Bursa and Izmir, tram services in Istanbul and Antalya, and IPT services named Dolmus (Figure 3-5) .



**Figure 3-5: Dolmus**

Dolmuses are privately owned minibuses, normally with a seating capacity of 14 passengers that run on fixed routes ( Figure 3-6) within cities as well as in the outskirts connecting other towns and villages. They work on a fixed fee system and cities have dedicated Dolmus stops just like buses. These vehicles are rented from a company working with the Municipality

(The Transport Coordination Centre) and the Departmental Traffic Commission, which also fix the fares and the routes.

### Issues

The issues related to the system are as follows:

3. Overcrowding: Up to 25 passengers are loaded on the vehicle, though the original capacity is of 14 passengers only.

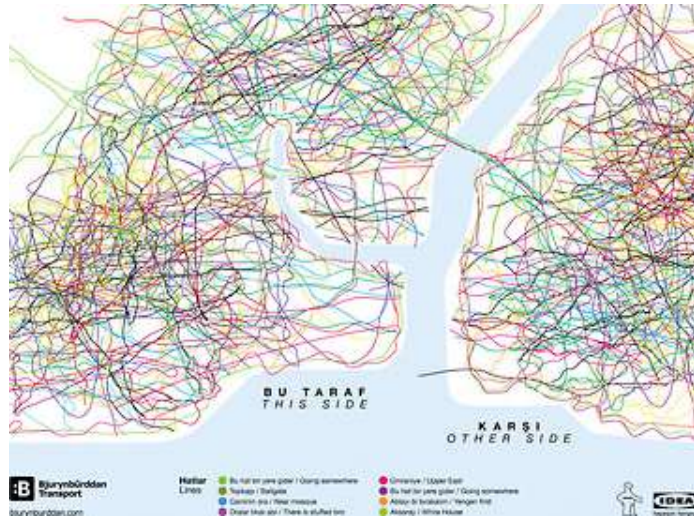


Figure 3-6: Dolmusa Routes

4. Lack of security: Dolmus drivers have a reputation of being aggressive, fearless, and rude. They drive dangerously and ignore all traffic rules.
5. No Complementarity: Because of the lack of coordination between the commission and the Municipality, buses and Dolmuses ply on the same routes, leading to oversupply and competition between the drivers on profitable routes and inadequate supply in other parts of the city.

### Solutions/Initiatives

To overcome the problems, the government decided to regulate the use of these Dolmuses by fixing a common tariff for buses and minibuses (with a unique ticket), for the commuters' convenience. It was also decided to give passenger information about the routes and stops via electric panels at terminal points, and on the vehicle itself. To solve the security problem, the drivers are trained and provided social benefits to improve their living and working conditions like medical insurance, parking, etc. Finally, the routes of the Dolmuses are rationalised to relieve congestion on the main roads, cover the entire city, and avoid competition with buses in the centre.

Thus, in this case the government decided to organise the system by providing a fixed tariff, giving training to drivers, rationalizing the routes, and improving the drivers living and working conditions.

## Fast Buses in Dakar (Senegal)

### *Introduction*

Dakar is the capital and the largest city in Senegal. It has a population of about 2.5 million, which is growing at twice the rate of the country as a whole. The city was founded on a peninsula and has now expanded outward in a funnel shape. Many of the newer satellite towns and suburbs are over 15 km from the city centre, where most of the employment centres are located. This situation has resulted in commuter trips that are longer than average in most cities of this size.



Figure 3-7: Fast Bus

In Dakar, owning a car is a privilege reserved for only the wealthiest. The taxi ride is also quite expensive, and 75% of the daily trips are made by public transport. There are a wide variety of transit options available, which are both a mix of formal and informal systems. The Formal transport is in the form of buses: DDD (Dakar Dem Dikk – large buses) and Tata (smaller buses). The informal transport is in form of minibuses (fast buses) and Mercedes vans (Ndiaga-Ndiaye).

IPT in Dakar is represented by Fast Buses (Figure 3-7) managed by different private owners. It consists of a fleet of 2,500-3,000 minibuses and provides for almost 80% of the public transport demand. Only 20% of the drivers own the buses. Licenses are given to the drivers by the Dakar government, on the advice of the regional transport commission. Tariffs are fixed by the Ministry of Commerce with the help of the Ministries of Transport and Finance.

In comparison to the public bus system, these fast buses provide an inexpensive and frequent service to the neighbourhoods. IPT is also represented by Ndiaga-Ndiaye. These are large white vans with an entry for passengers from the back. Their main advantage is an assured seat for everyone.

### *Issues*

Until recently, and despite their name, “fast buses” were in a very poor condition. They were very old and slow and had frequent breakdowns. Also, drivers were not given any formal training, and they sometimes did not follow the fixed routes. In short, though these buses provided a dense network of services and the fares were relatively low, their service quality was poor and disorderly. The operators were able to cover their running costs but unable to afford the maintenance of vehicles and the renewal of license.

### *Initiatives/Solutions*

In response to the declining standard of bus services, the government proposed a program whereby it would finance the renewal of the minibus fleet with the objective of formalising operations 1) through the introduction of a formal system of route allocation and an official fare structure and 2) a provision for technical assistance and training for operators and drivers. In this program, participating operators were required to form cooperatives, or economic interest groupings (EIGs), which were to be collectively responsible for loan repayments. These EIGs collectively formed the Urban Transport Financing group. The program, however, did not result in any increase in transport capacity.

In 2005, 505 minibuses were replaced by Tata Mini Buses under this financial agreement with the help of International Development Association (IDA), working under the World Bank. A second phase of the bus renewal financial scheme is being considered and the focus will now be on the maintenance of the renewed fleet.

In this system the government mainly focused on providing a financial scheme for the purchase and maintenance of the old fleet.



## Daladalas in Dar-Es-Salaam (Tanzania)

### Introduction

Dar-Es-Salaam is Tanzania's largest and richest city, a regionally important economic centre. It has a population of 4.4 million. The city contains high concentrations of trade and other services and manufacturing compared to other parts of Tanzania, which has about 80% of its population in rural areas. Most intra-city transport is by the Daladalas (minibuses) and Dar Es Salaam Commuter Rail. A BRTS is also in the pipeline.



Figure 3-8: Daladalas

Daladalas are cheap minibuses (Figure 3-8) operating on fixed routes, marked with specially coloured stripes that identify their origin and destination. The routes are fixed by the Surface and Marine Transport Regulatory Authority (Figure 3-9). The Daladalas are operated by a driver and a conductor: the conductor collects the fare and signals the driver to leave.

Daladalas owners are required to submit legal contracts between them and the drivers to SUMATRA (Surface and Marine Transport Regulatory Authority) to get operating licenses, but in most cases, the owners don't comply. The majority of drivers work under a lease agreement where they have to pay the owner a fixed amount per day.

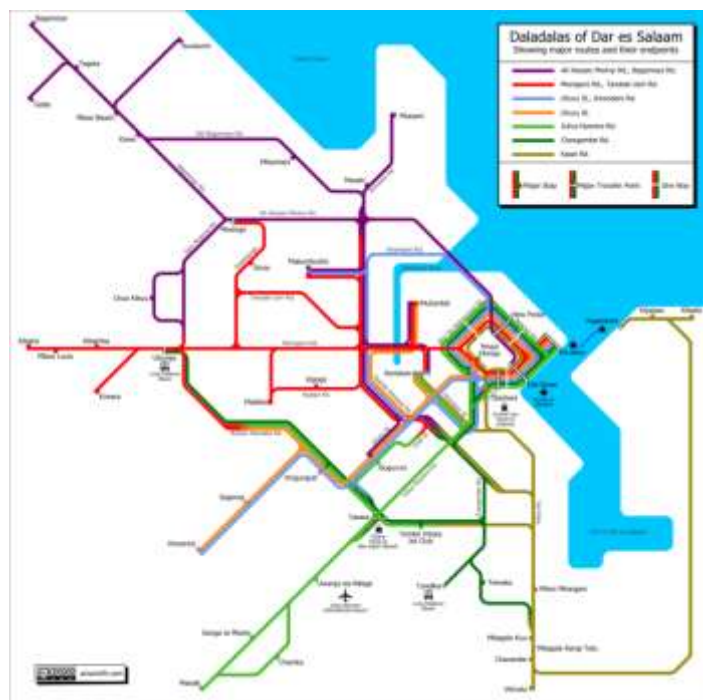


Figure 3-9: Daladalas Route map

Daladalas carry 1.4 million passengers per day. The average travel distance is between 10 and 20 kms, and the average speed is between 10 and 20km/h. 98% of the users have no car and are dependent on Daladalas.

### *Issues*

The following are issues faced:

- Lack of comfort and security: The vehicles are overcrowded, with passengers hanging outside the door. They account for a large percentage of road accidents and are not comfortable either.
- No licenses: Very few owners have licenses. They just rent the vehicle illegally to a driver and get a daily rent out of it.
- Bad working conditions: Drivers and conductors work for up to 17 hours. As a result, drivers and conductors have poor health resulting in safety problems and poor customer care.
- Lack of service in the suburbs: There is no Daladalas in the suburbs, which are served mainly by motorcycles, saloon cars and light trucks operating illegally.

### *Solutions/Initiatives*

- It is planned to reorganise the Daladalas service and to integrate these vehicles to the proposed DART (Dar Rapid Transit - local BRTS), to prevent competition between the two modes.
- The government has decided to stop issuing Daladalas licenses in the CBD area and relocate them to peri-urban routes, uncovered by the first DART phase.
- Along with reorganising the service, the government is also thinking of upgrading the quality of the vehicles and provide trainings to the drivers to make it safer. More enforcement is also planned to check and fine whoever does not have a license.

In this case the government has decided to reallocate routes, integrate with other modes of transport and provide driver training.

## G Auto in Ahmedabad

### Introduction

Ahmedabad is the largest city and former capital of the western Indian state of Gujarat with a population of 5.6 million, and it is located on the banks of the Sabarmati River. There are a wide variety of transport modes in the city like BRTS, city buses, autorickshaws, railways, etc and a metro system is in the pipeline.

### Issues

The following are the issues faced:

- Rickshaw drivers are unwilling and refuse to travel for shorter distances.
- Commuters have to come to the main stand to hire an auto as they aren't accessible everywhere.
- Rickshaw drivers charge the passengers excessively or take a longer route to make more money.
- Autorickshaws are not considered safe for travel, especially at nights.

### Initiatives/ Solutions

G-Auto is the first and the largest organised fleet of CNG- auto service of India that provides 24X7 Auto on call. G-Auto is a concept wherein autorickshaw drivers are organised under the social umbrella brand 'G-Auto' to provide safe, reliable and reasonable autorickshaw service to commuters.

G-Auto consists of more than 10,000 autorickshaws across Delhi, Ahmedabad,

Gandhinagar, Surat and Rajkot, and it is expected to grow to at least 50,000 by 2015. Nirmal Foundation plans to replicate this model across all the major cities of the country. The



Figure 3-10: ITS Fitment in the autos

foundation also aims to achieve the target of operating more than 10, 00,000 autorickshaws by 2020.

The main initiative taken by this organisation is the usage of ITS components like the use of GPS for vehicle locator (Figure 3-10), passenger information centre and the usage of electronic fare meter in autorickshaws. This has decreased the waiting time and made the travel quick and stress free. Apart from this, the drivers are also provided with social benefits like training, medical insurance, etc.

### **Lessons learned from case studies**

The lessons learned from the case studies can be broadly clubbed into the following categories:

#### **1. Need of a regulatory authority for IPT**

The IPT system needs a regulatory body to answer the transport needs as found in the case of South Africa, where the IPT system has been formalised, legalised, and recognised by the government as an essential mode of transport. It makes the system more attractive, safe, comfortable and efficient for users. Also the authority should have the power to fix routes and tariffs like in the case of Tanzania and Turkey.

#### **2. Need of proper infrastructure facilities**

Proper infrastructure facilities like lanes, parking, signage must be provided to ensure smooth and efficient operations as in the case of Indonesia. It helps to increase safety and reliability among users.

Also IPT modes should be integrated with the other means of transport to make it more convenient for the users to commute from one mode to another (like in the case of Tanzania and Indonesia). Intermodal platforms can be created at a few locations for attracting more users who are reluctant to use IPT.

#### **3. Provision of social benefits to drivers**

It is seen that providing social benefits increases the efficiency of services by the drivers. These benefits can include trainings, medical insurance, pension, minimum wages, uniforms and a good working conditions like in case of Ahmedabad (India), South Africa, Turkey, Indonesia and Dar-Es-Salaam (Tanzania).

#### **4. Financial support for drivers**

Special financial agreements must be signed between the government and international organisations, banks etc to buy new vehicles and also renew the old fleet as it has been done in case of Senegal (Dakar).

#### **5. Use of alternative fuel types for IPT vehicles**

Use of CNG like alternative fuels as in case of G-Auto, Ahmedabad can enable these vehicles to meet with the emission standards and norms.

#### **6. Usage of modern technology**

Modern technology, like ITS in case of Ahmedabad, must be used to introduce 24x 7 availability of vehicles and improve the safety of vehicles for drivers as well as commuters, as the vehicles can be easily tracked. Also, information must be provided to the commuters regarding the routes, directions, time table, as done in the case of Turkey, since organising and regularising the fleet attracts more commuters.

Comparative Table of all cities is given in Annexure 1

## 4. CITY ANALYSIS

To understand the existing situation for the IPT system in Indian cities, a survey of drivers, users, unions and authority was conducted across 19 cities (List given in chapter 1). The questionnaire prepared for the study (Refer Annexure 2) was discussed with more than 2,000 respondents including 19 regional transport officers, 19 traffic police officers and approximately 2,000 drivers, unions, users and others across all cities.

For the purpose of this analysis, cities have been grouped into three categories based on the city size (Category 1, 2 and 3), also mentioned in chapter 1 of the report (Refer Table No.1).

The subsequent section discusses the feedback received from the survey in details.

### IPT vehicles per lakh of population

The number of IPT vehicles available varies across cities as shown in Figure 4-1. The analysis of figure 4-1 indicates that there is no relationship between the city size in terms of population and number of IPT vehicles. The highest number of IPT vehicles is in Surat, Bangalore and Amritsar and the lowest are in Kolkata, Lucknow, Alwar and Jammu.

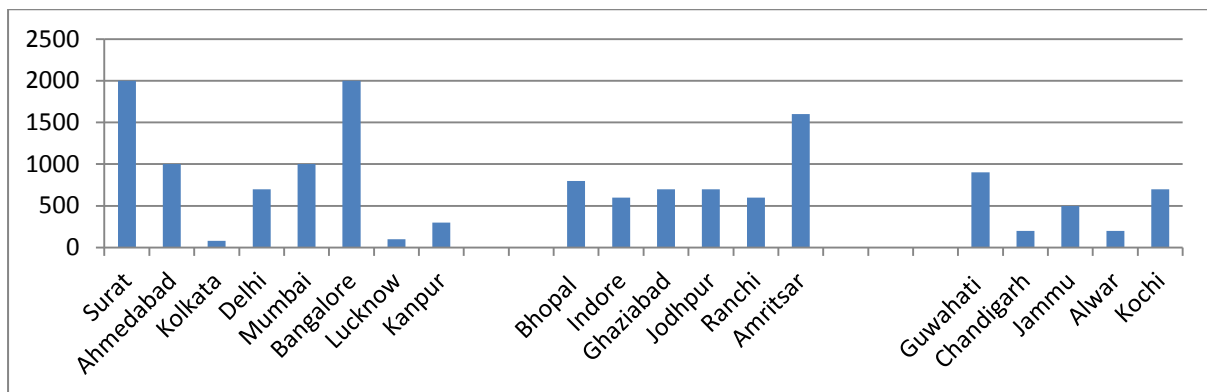


Figure 4-1: IPT vehicles/lakh population

## Role of IPT

In case of defining the role of IPT in cities, it is seen that in the category 1 and 2 cities, these IPT vehicles primarily act as a substitute to the public transport. However, exceptions have been observed in Bhopal and Indore. In the case of these two cities it acts as a feeder to the newly introduced BRT system.



Figure 4-2: A three-seater autorickshaw



Figure 4-3: Tempos/ Vikrams

In case of category 3 cities, the additional role played by IPT is as follows:

1. Feeder to the main mode of public transport like metro, BRT, suburban rail etc.  
An example of such cities: Delhi, Mumbai, Kolkata, Ahmedabad
2. Substitute to the public transport

The only exception in this category are Surat, Lucknow and Kanpur, which exhibits similar characteristics to 2 and 1 cities, as the bus system is poor and IPT serves as the main mode of public transport.

### Type of IPT

From the pie diagram (Figure 4-4) it can be observed that three-seater autorickshaws (60%) pre-dominate the IPT sector across India. This is followed by Tata Magic<sup>4</sup> (24%) as many cities like Delhi, Bhopal, Alwar are switching to a higher grade vehicle in order to comply with the emission standards. Tempos/Vikrams<sup>5</sup> constitute only 16%.

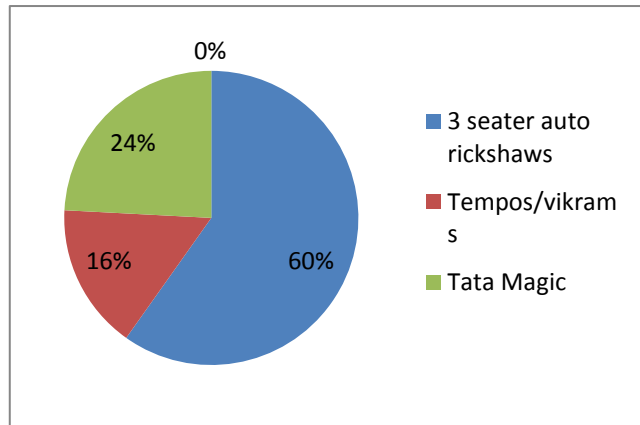


Figure 4-4: IPT composition

### Regulatory bodies

The existing regulatory authorities for all city categories are the Regional Transport Authority/ District Transport Office and the Traffic Police.

### Routes

From the graph (Figure 4-5) it is seen that about 80% of the three-seater autorickshaws do not have fixed routes in operation, except in the case of Guwahati and Kolkata. However, most of the vikrams /tempos (70%) operate on fixed routes. These are fixed by the drivers and the unions themselves, and only 23% of the routes are fixed by RTA as in case of Lucknow, Alwar, Bhopal and Jodhpur.

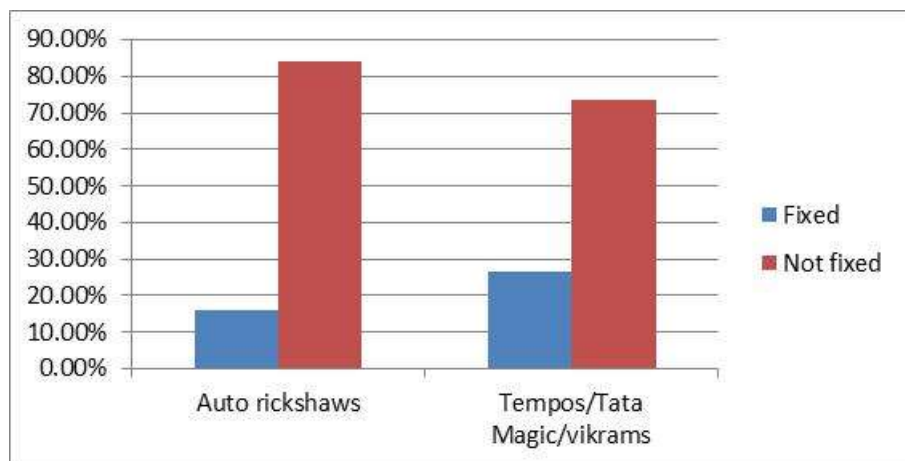


Figure 4-5: Routes Fixation of IPT vehicles

<sup>4</sup>These are 4 wheeler IPT vehicles with a seating capacity of 8 passengers

<sup>5</sup>Tempos/ vikram are 3 wheeler IPT with a seating capacity of 6-8 passengers



**Fares**

There are no fixed rules for the fixation of fares. In case of three-seater autorickshaws the fares are usually fixed by the RTA (75% approx) on the basis of a Government notification. In case of tempos /Vikrams/ Tata Magic, 70% of the cities do not have a fixed fare system, and the tariff is decided by the unions and the drivers



Figure 4-6: Fare meter

themselves. (Figure 4-7)

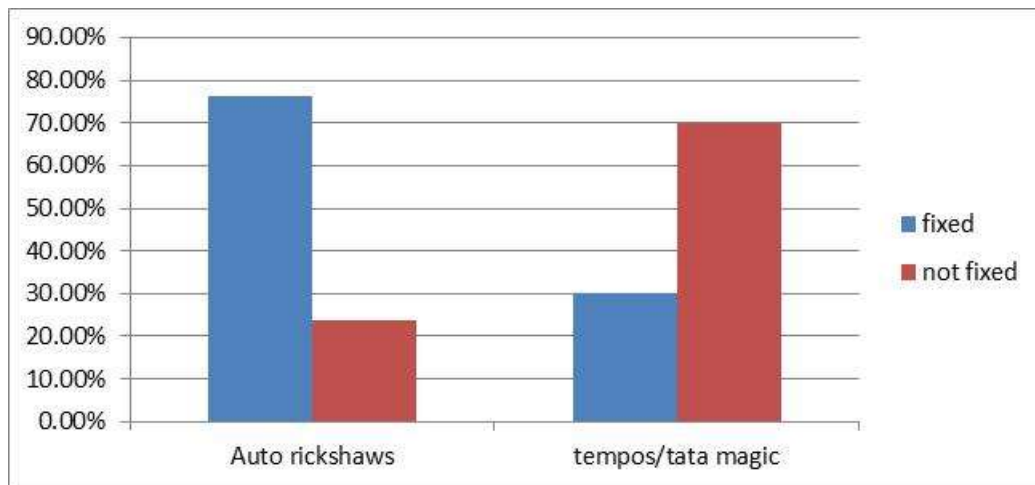


Figure 4-7: Fares Fixation

**Acts and Laws**

For all the defined categories, the Central motor vehicles act and the state motor vehicle rules are the main laws and guidelines for the regulation of IPT vehicles.

**Vehicle characteristics**

The city size does not have a bearing on the fuel type or characteristics of IPT vehicles (Figure 4-8 and 4-9). It can be observed that 64% of the vehicle technology across Indian cities is 4-stroke. 2-stroke accounts for only 36% and are mostly found in category 1 and 2 size cities like Bhopal, Ranchi, Guwahati etc when compared to bigger cities like Delhi, Mumbai, Kolkata, with exceptions being Chandigarh, Jodhpur.

The predominant fuel type used by IPT vehicles across India is CNG/ LPG (60%). After the High Court mandates were issued, IPT vehicles in all metropolitan cities like Delhi, Mumbai, Bangalore, Kolkata, converted the fuel type to CNG/ LPG. Smaller cities like Chandigarh, Amritsar and Jodhpur are also slowly converting to LPG following a mandate issued by the High court to switch to cleaner fuels in tourist cities. About 40% of the cities, mostly belonging to category 1 and 2, are still using a blend diesel and petrol vehicles.

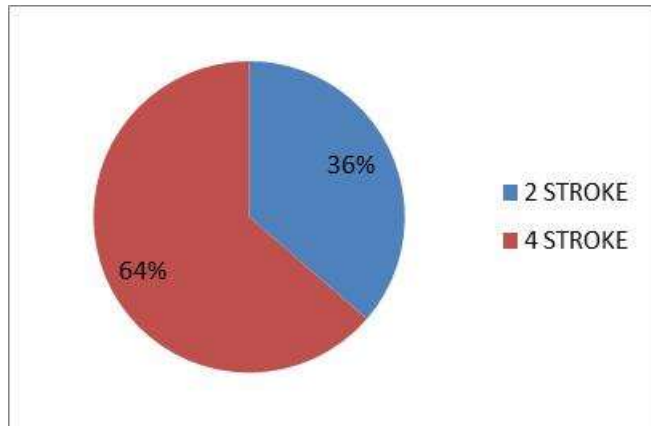


Figure 4-8: Vehicle Technology

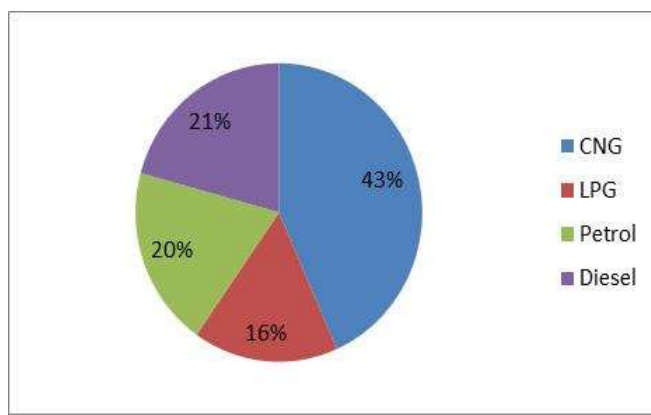


Figure 4-9: Fuel Type

**Infrastructure facilities**

None of the cities covered as part of the study have proper infrastructure facilities like stands, parking space, dedicated lanes, etc. All the city corporations and the Nagar Nigam (except Kolkata and Bangalore) have notified stands for IPT vehicles. But it has been observed that these vehicles do not follow the rules and often queue on the roads leading to congestion (Figure 4-10). Also, due to a lack of enforcement, these stands are often found to be encroached by hawkers or other obstacles.



Figure 4-10: IPT vehicles queuing on the sides of the roads

## Licensing procedure

### *Documents required for getting permits*

The process for getting the required permit documents is more or less similar for all city sizes. These documents are listed below:

- Form (application form) to the Regional Transport Officer
- Residence Proof
- Court stamp paper of Rs.10 value
- Driving license
- Fitness certificate
- Insurance—vehicle insurance
- Pollution under control certificate

In case of Ahmedabad, Surat and Lucknow, additional documents like 8<sup>th</sup> pass certificate and meter number are required. For Kolkata and Delhi, bank account statements and financial stability of drivers' proofs are also required.

### *New Permit and renewal fees*

The fees for obtaining a new permit from the RTA range between Rs 350 and 550 for all category cities (Average Rs 450 approx.) and the renewal fees range between Rs 200 and 550 (Average Rs 375). The lowest permit fees are charged in Jammu (Rs 150) and the highest permit fees are in Delhi, Kanpur Indore and Alwar, where on an average Rs 1,500 is charged for the issue of permits to Tata Magic vehicles as they are an advanced version of tempos. The permits are renewed in nearly all cities within a time period of 5 years. The only exceptions are Ahmedabad and Jammu where the renewal time is 3 years and 1 year, respectively. (Refer to figure 4-11)

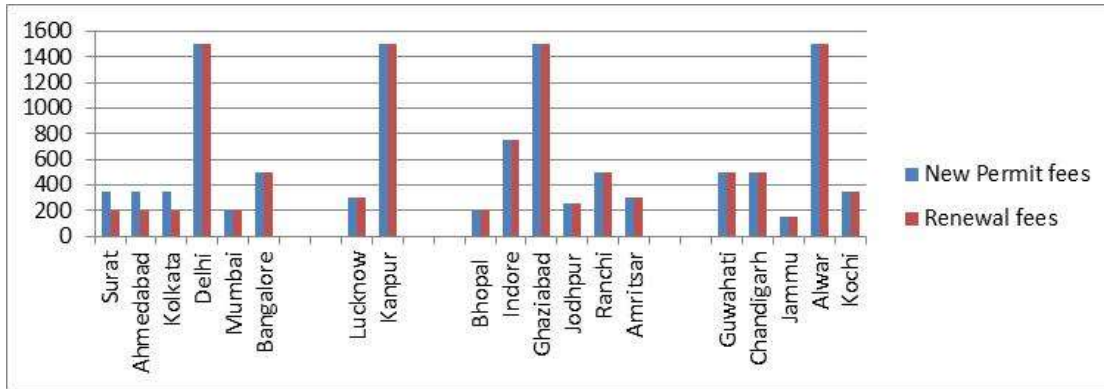


Figure 4-11: New Permit and Renewal Fees

### Time for processing

The average processing time for the issue of permits across cities is less than 15 days. However the only exception is found in the case of Kolkata and Bangalore, where the processing time taken is 1.5 months and 1 month, respectively.

## Drivers survey

### Qualification of drivers

It is observed (Figure 4-12) that more than 2/3 of the drivers working in this sector have completed primary education and another 23% have completed secondary education. Only 3% of the total drivers are graduates and 7% are illiterate. In case of Kanpur a much higher percentage of graduates (above 20%) are observed.

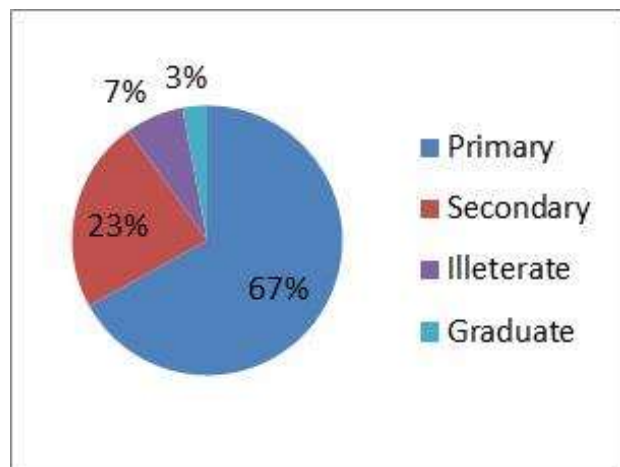


Figure 4-12: Educational Qualification Levels

### Ownership of vehicles

Most of the drivers surveyed (70%) did not own an autorickshaw and were operating these vehicles on rent (Figure 4-13). The exceptions were found only in Alwar where ownership is about 72% due to the

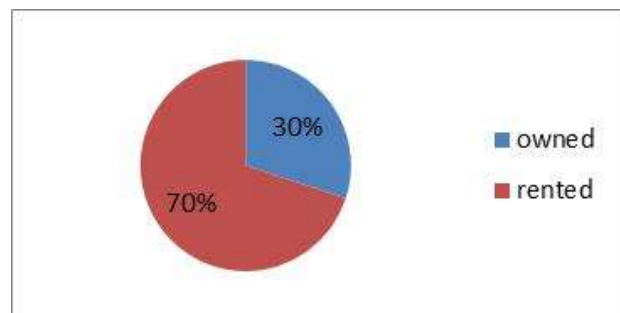


Figure 4-13: Ownership of Vehicles

initiatives taken by the authorities under AlwarVahini. Also, higher ownership is found in Jammu and Amritsar, where it is about 60%.

**Rent per day**

It is observed (Figure 4-14) from the feedback received that for three-seater autorickshaws the rent varies between Rs 150 and 350/ day (Average of Rs 250) and for Tata Magic it is in the range of Rs 500-750 per day. The highest rent is Rs 700 being paid by drivers in Indore, followed by Delhi and Alwar. In larger cities like Ahmedabad and Surat the rent for three-seater autorickshaws and tempos is more or less same.

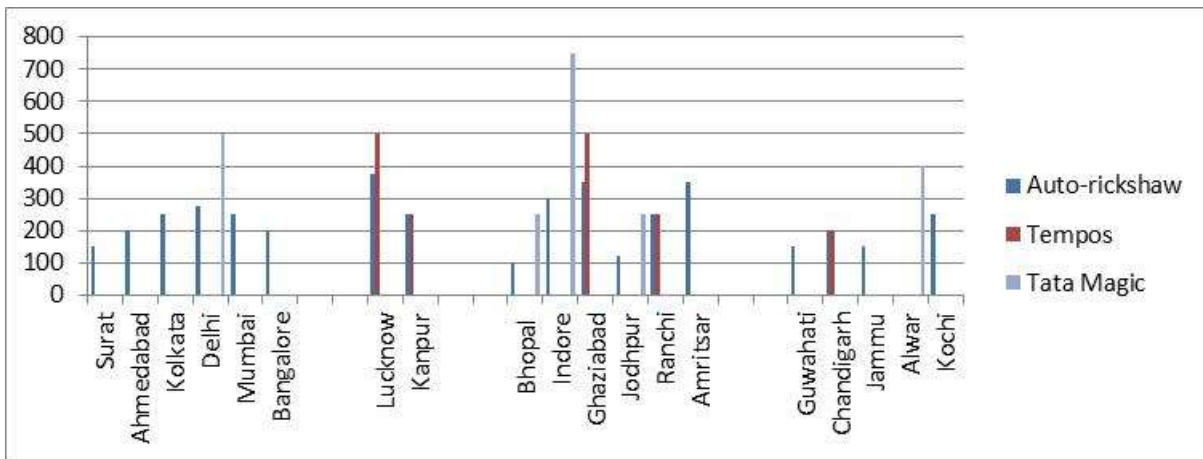


Figure 4-14: Rent/day

**Average length driven per day**

It is seen (Figure 4-15) that on an average a driver operates between 82 kms and 120 kms per day, the average for all cities being 100 kms/day. The maximum operating kilometres

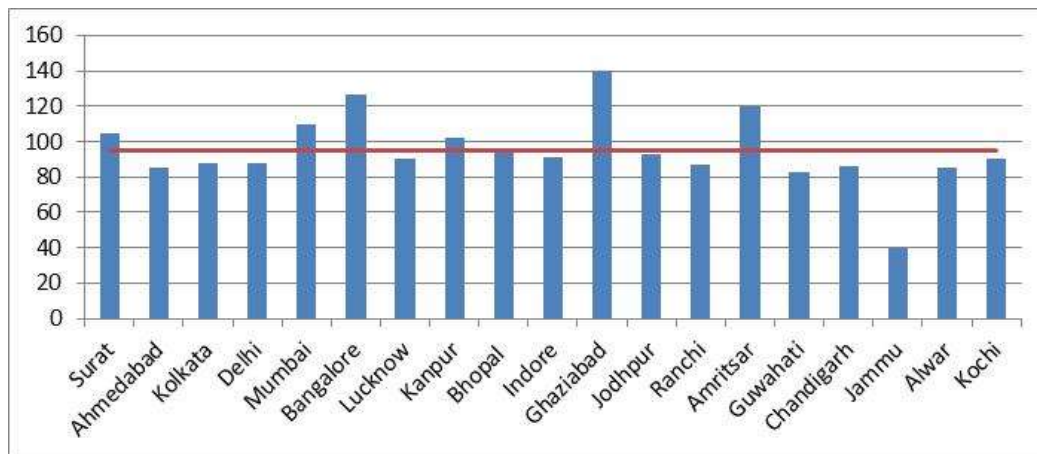


Figure 4-15: Average kms/day driven

have been recorded in Mumbai and Bangalore where these vehicles are plying for more than 110 kms per day and Ghaziabad at 140 kms/day.

### *Average passengers per day*

The average ridership across all cities is 45 passengers/day. Guwahati has the lowest ridership of 10 passengers/day followed by Bangalore at 25 passengers/day. The reason for the low patronage of IPT in Guwahati is because the users consider it an expensive mode as the fares that are fixed by the government are high and not rationally calculated. In case of Bangalore, the city bus service is good and the users do not prefer to use IPT, which is expensive in comparison to the bus service. The highest patronage is seen in Ranchi, Alwar, Amritsar and Kanpur as in these cities IPT is used as a main mode of transport in the absence of an organised bus system (Figure 4-16).

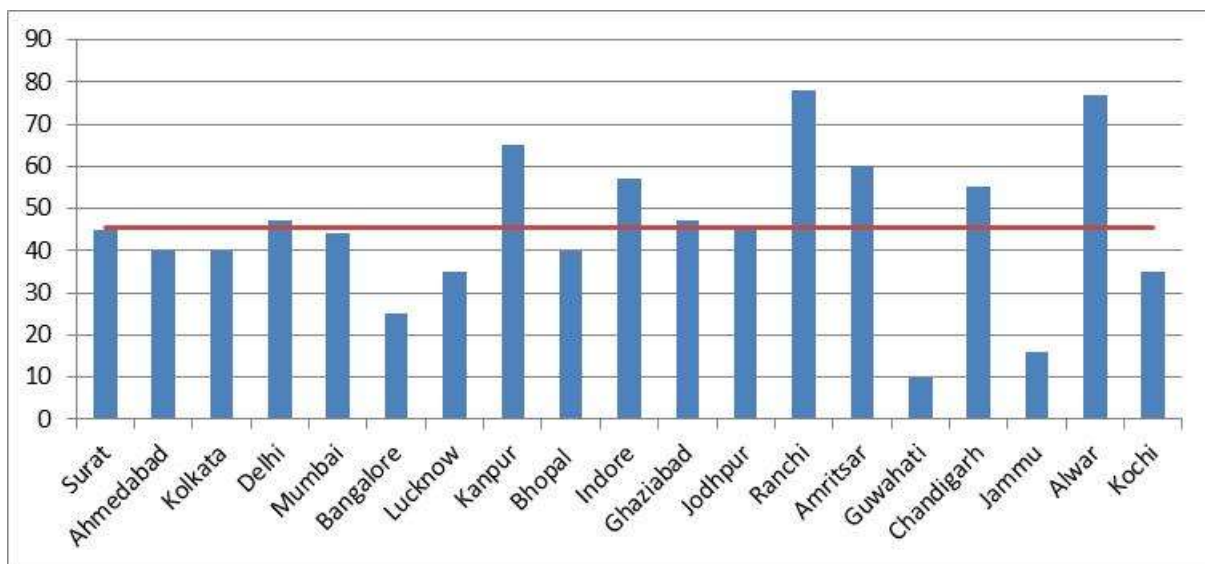


Figure 4-16: Average passengers/day

### *Revenue earned/day*

#### **General Autorickshaw service- with and without rent**

On an average, the driver of a three-seater autorickshaw earns an average revenue of Rs 12,000 excluding the rent (Refer to Table 4-1). In case of profitable routes, this earning increases to Rs 20,000. However, in case the drivers have to pay rent, their earning per month reduces to Rs 4,250, which in case of profitable routes is Rs 12,500.

**Shuttle services –with and without rent**

For services operated as shared/ shuttle the revenue earned per month without rent is Rs 15,000 per month (Refer to, Table 4-1) which increases to Rs 23,000 for profitable routes. For IPT vehicles operated on rent, the average monthly revenue reduces to Rs 7,500/ month and in case of profitable routes to Rs 15,000).

**Table 4-1 Revenue earned/month—general services**

Description	Earning/month (Rs)	Average/month (Rs)
<b>A. General Services</b>		
Earning without rent (general routes)	9,000-15,000	12,000
Earning without rent (profitable routes)	15,000-25,000	20,000
Earning with rent (general routes)	3,000- 5,500	4,250
Earning with rent (profitable routes)	10,000-15,000	12,500
<b>B. Shuttle Services/ Shared Services</b>		
Earning without rent (general routes)	10,000 – 20,000	15,000
Earning without rent (profitable routes)	18,000-28,000	23,000
Earning with rent (general routes)	5,000-10,000	7,500
Earning with rent (profitable routes)	10,000-20,000	15,000

The above analysis indicates that nearly 50% of the earnings of a driver goes towards rent. This has a significant impact on the financial status and the overall well-being of the drivers.

***Maintenance cost/ month***

The average maintenance cost of three-seater autorickshaws of different variants and Vikrams/tempos is given in the table below:

Table 4-2 Maintenance cost/month

Maintenance cost	Cost/ month (Rs)	Average/ month (Rs)
Three-seater autorickshaws- CNG/LPG- 4 stroke	1,500-2,500	2,000
Three-seater autorickshaws- CNG/LPG- 2 stroke	1,700	1,700
Three-seater autorickshaws- petrol- 4 stroke	1,500-2,500	2,500
Three-seater autorickshaws- petrol- 2 stroke	500-600	550
Vikram/tempos/Tata magic- CNG -2 & 4 stroke	1,500-2,000	1750
Vikram/tempos/Tata magic- petrol & diesel -2 stroke	700-1,000	850

It can be seen from the Table 4-2 that the average maintenance cost is Rs 1,700 for three-wheeler autorickshaws i.e., 5% of total earnings and for Vikram/Tata magic it is Rs 1,300 per month (3% of total earnings).

Considering the expenses incurred by a driver on daily maintenance, fuel and rent, the average monthly saving of a driver is Rs 5,000 (Refer to Table 4-3). Average miscellaneous cost as per table 4-3 is Rs 300/ month

Table 4-3 Total savings/month

Description	Average Earning/ month (Rs)	Average Maintenance cost / month	Fuel Cost/month	Average of other expenses/month <sup>6</sup>	Total Savings / month
<b>General Services</b>					
Earning without rent (general routes)	12,000	1,700	6,500	300	3,500
Earning without rent (profitable routes)	20,000	1,700	6,500	300	11,500
Earning with rent (general routes)	4,250	1,700	6,500	300	-4250

<sup>6</sup>Average for all cities is considered. It included bribes taken by Traffic Police, union membership, other expenses



Earning with rent (profitable routes)	12,500	1,700	6,500	300	4000
<b>Shuttle Services/ Shared Services</b>					
Earning without rent (general routes)	15,000	1,300	7,500	300	5,900
Earning without rent (profitable routes)	23,000	1,300	7,500	300	13,900
Earning with rent (general routes)	7500	1,300	7,500	300	-1,600
Earning with rent (profitable routes)	15,000	1,300	7,500	300	5,900

**Auto Unions**

It is seen (Figure 4-17) that the registered number of trade unions in all cities ranges from 1-5 and the highest is in Kolkata, as each route has a separate union. Bangalore also has a large number of unions. However, in case of Surat, Ahmedabad and Lucknow unregistered unions exist in cities as well.

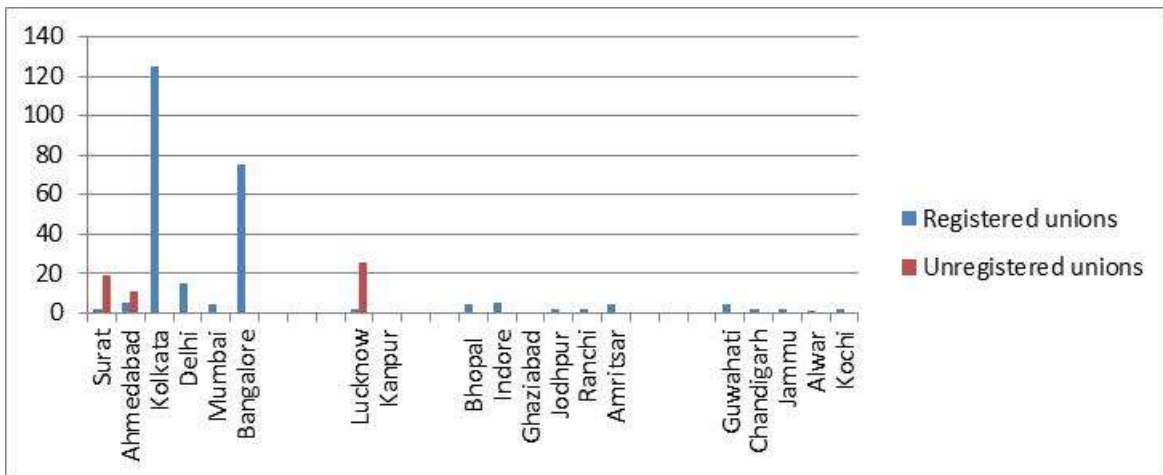


Figure 4-17: Auto Unions

**Funding Pattern**

For the purchase of vehicles, most of the IPT owners access private banks and money lenders (75%) and very few lend from the nationalised banks (about 23% only). This trend is prevalent in all cities except the category 3 cities (Figure 4-18) where the government, in

association with prospective nationalised banks, has taken effective measures to give cheap loans. One such city-specific order was by the High Court and Supreme Court to convert all IPT vehicles to CNG/LPG 4 stroke vehicles, which resulted in cheap and easy loans for prospective IPT.

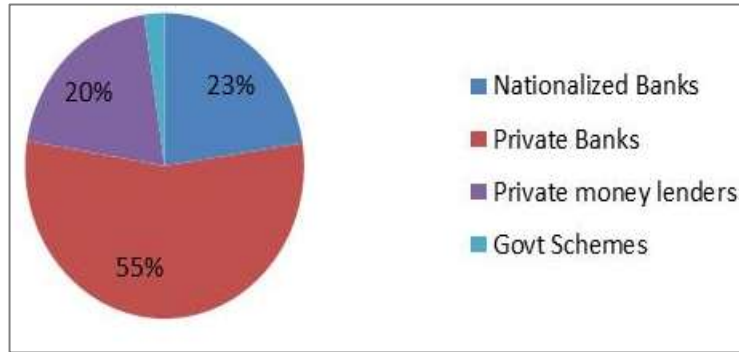


Figure 4-18 Financing options

**Users’ survey**

*Age group users*

It is seen (Figure 4-19) that more or less people in all age groups use the IPT system. However, commuters in the age group of 30-40 years or are predominant (33%) followed by age group 20-30 years (29%). There is a very little percentage of users above 50 years of age (7%) who use the IPT system. Thus, it can be concluded that the working population generally uses the system.

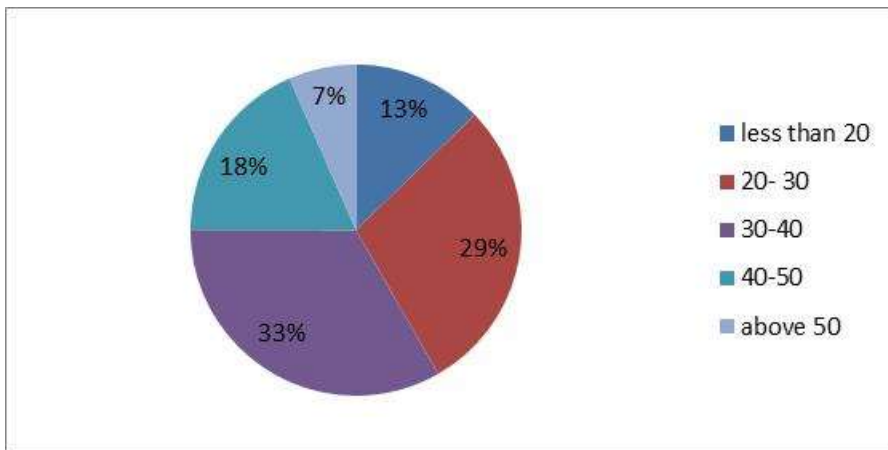


Figure 4-19: Age group usage

*Trip Purpose*

The system is mostly used in cities for three different purposes: work, social, educational and others (Figure 4-20). In all cities more than 52% of the trips are for work, followed by 31% of social trips, 16% for educational trips and other trips are at 1%. However, there are a

few exceptions as in case of Delhi and Bangalore, where social trips are lower compared to educational trips. This is because these cities have a large number of educational institutes, and therefore student population is high.

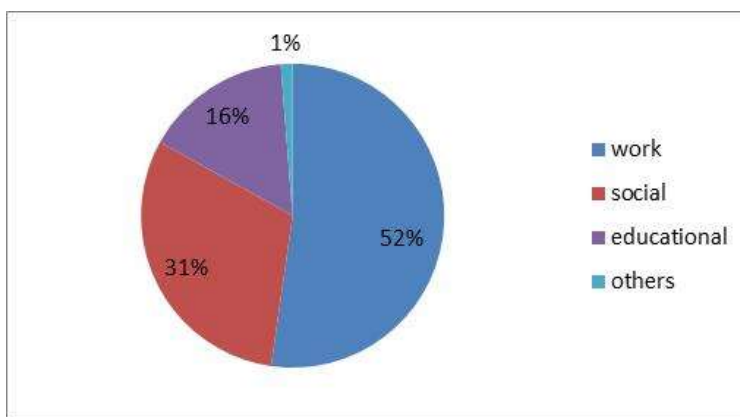


Figure 4-20: Trip Purpose

**Average Distance Travelled by Passengers**

It is observed from the graph (Figure 4-21) that the average distance travelled ranges between 5 and 6 kms. (average being 5.5 kms, except in Surat where the distance travelled 4.5 kms) and in category 3 cities such as Ahmedabad, Bangalore, where the average trip length is above 7 and 8. Ghaziabad has also exhibited larger trip lengths as most of people commute to the neighboring state of Delhi.

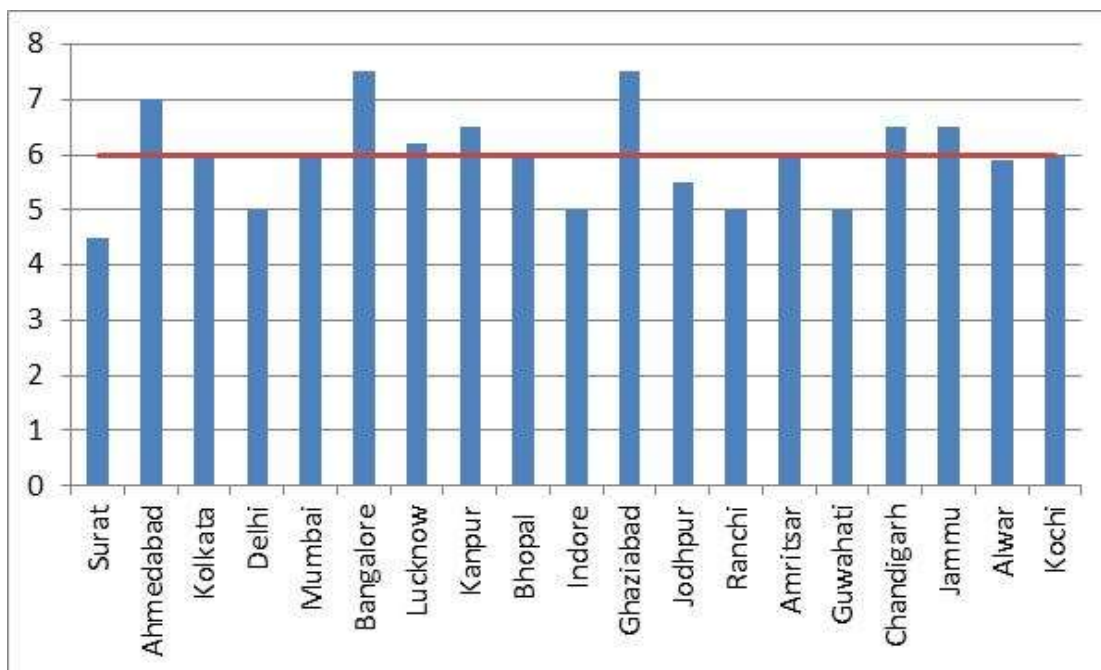


Figure 4-21: The distance travelled by passengers

**Expenditure/month spends on IPT**

The average expenditure per month by IPT users in category 3 cities is Rs 500-700 (Average Rs 600/ month) as compared to category 1 and 2 which is RS 400-600/month (average Rs

500/month). The highest is seen (Figure 4-22) in the case of Mumbai, Bangalore, Lucknow and Kanpur. Only exception in this category are Ghaziabad and Guwahati where the expenditure is close to Rs 700. In Guwahati, the fares are not fixed rationally and in Ghaziabad the expenditure is high due to interstate trips.

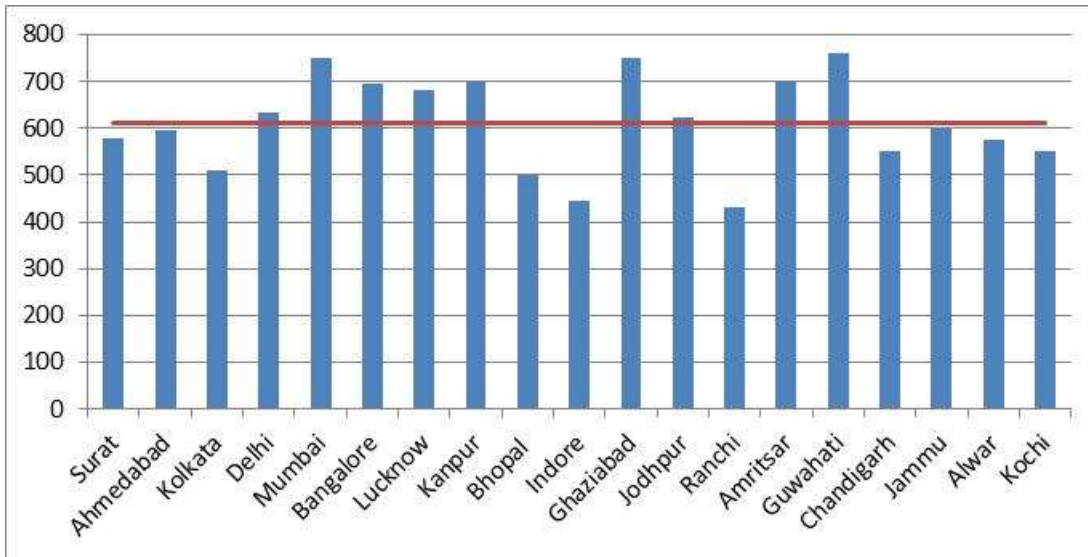


Figure 4-22: Expenditure /month on IPT

### Conclusions

The above analysis shows that category 3 cities have more or less some similar features and are much ahead in terms of technology development and infrastructure as compared to class 2 and 1, which are smaller and are still far behind in terms of development, infrastructure and lack of awareness, leading to a poor and more unorganised IPT system with more and greater challenges in the future. The pros and cons of the IPT services provided across the country are summarized in Table 4-4 below

Table 4-4: Pros and Cons of IPT services

Pros	Cons
Provides mobility and connectivity in small and medium sized cities	The sector is unorganised as there is no institutional setup
Source of employment	Low level of education of the drivers
Complements the formal public transport services and provides last mile connectivity	No fixed fares in many cities – overcharging by the drivers
Generally a low-cost service	Poor maintenance and high polluting vehicles
Requires very less parking space	Obsolete technology – high fuel consumption

Pros	Cons
Flexible to commuters' needs	Lack of financial support for the drivers, which results in lower revenue and lack of economic stability of the driver
	Lack of infrastructure facilities

Some observations and issues related to the IPT sector in the Indian cities has been dealt in detail in the next chapter.

## 5.OBSERVATIONS & ISSUES

IPT is used extensively in Indian cities. They are not only operating in small and medium sizes cities but even in popular large cities as they play an important role in providing low-cost mobility to a large section of the society. While in small cities and medium cities they act as the public transport system, in large cities, they act as a feeder service to the public transport. However, in spite of the important role that they play, there are various issues related to them. As given in the previous chapter, an actual survey and stakeholder consultation were done for 19 cities across India; the major issues and observations from the survey can be clubbed under the following broad categories:

1. Policy/regulatory framework for IPT
2. No economic stability for drivers
3. Lack of infrastructure facilities
4. Lack of social benefits for the drivers
5. Outdated technology to meet emission standards
6. Lack of usage of modern technology (ITS)
7. Lack of financial support
8. Lack of ownership/institution of the IPT sector

Each of the issues is dealt in details in the next sections:

### Policy/regulatory framework for IPT

#### *Acts and Rules*

There are many acts and rules pertaining to motor vehicles at the central and state level (i.e. Motor Vehicles Act 1988, Motor Vehicles Rules 1989, and various state rules). All these acts talk in general about the issue of driving licenses, methods of registration, permits, offenses, penalties etc, but do not address the following aspects of IPT like:

- The method for fixing the routes and fares (except the use of fare meters) for stage and contract carriages,
- Use of modern technologies to improve performance of IPT vehicles,
- Methods of innovative financing of vehicles,

- The improvement of socio-economic driving conditions of commercial drivers except the specification of working hours if fixed by the state government (in the MV Act 1988 and states act), and
- The institutions and then its role for enforcement of various duties and responsibilities related to motor vehicles other than identifying the RTO/DTO as the registering authority.

### *Permits*

The permit system in India is regulated by the RTO. However, there is a lack of consistency and transparency on the issue of permits for various cities. For example the time limit for issue of permits, permit fees, time limit for processing, documents required vary from city to city. Also a few cities follow the open permit system while in others it is closed. In case of a closed permit system, there is a cap on the number of IPT vehicles operating in the city as in the case of Mumbai, Kolkata, Delhi etc. In an open permit system, there is no cap on the number of permits issued as in case of Surat. It may be also noted that the cap on the number of IPT vehicles is not rational, which results in a large number of IPT vehicles operating in the city as was seen in many cities like Kolkata, Lucknow, Delhi etc.

### *Fare fixation*

Fares are either fixed by RTA/RTO as in case of Delhi, Kolkata, Ahmedabad or by the unions like Ghaziabad, Alwar etc. However, in both cases there is a lack of standardized analytical framework for fare determination, implementation and revision. This often leads to overcharging by drivers and conflicts between drivers, unions, commuters and authorities.

### *Routes*

In most cities, routes are fixed by the RTOs or unions. However, there is a lack of proper route rationalisation that leads to greater competition between drivers, rash driving practices and inappropriate distribution services in the city.

### *Lack of enforcement*

In a few cities, though demarcated stands are provided, they are often not rationally located and the IPT vehicles stand on the roadside. Also, in cities the amount of bribes taken by the traffic police and authorities often lead to lower earning of drivers in all cities.

### **No economic stability for drivers**

The use of IPT vehicles is extensive in Indian cities, however the sector is unorganised where the services are provided by individual drivers (who may be owner drivers or rented drivers). The drivers' profile survey indicates that most of the drivers are financially weak and a few of them are only seasonal workers. As a result, most of them hire these vehicles for rent from the auto owner. The survey also indicates that since the vehicles are rented, high rental costs (varying from city to city) are often paid by the drivers to owners, resulting in more refusals, overcharging by drivers and poor quality of services to commuters. The net revenue earned by the operators is very low and in some cases is even lower than the minimum wages specified by various state Labour Departments. The earning is generally observed to be lower in case of three-seater services provided by IPT vehicles (except the airport and railway station services) as compared to the shared IPT, as these shared vehicles carry more passengers. Also in a few cities like Surat, Ahmedabad where school permits are given, drivers often earn more revenue compared to others. Other than the fare box revenue in cities like Guwahati where advertisements are allowed, earning is also observed to be more.

Other reasons for low revenue are:

1. The monthly maintenance cost of Rs 1,500 or above,
2. The fuel cost,
3. Membership fees to unions, and
4. Bribes to traffic police borne by the drivers.

### **Lack of infrastructure facilities**

This sector is not formally recognized by the government and therefore often lacks with the basic infrastructures facilities and work environment for the drivers.



### ***Lack of adequate stands***

In cities, adequate number of IPT stands have not been provided. Therefore, these vehicles queue and stop at any locations on the road leading to more congestion and confusion especially near the junctions. In some cities like Jodhpur, Ahmedabad etc., though stands have been created, yet the vehicles queue on roads due to lack of enforcement leading to congestion.

### ***No interchange points***

There is a complete lack of physical integration of various modes in the city. The stands that have been provided in cities are at inappropriate locations where there are no passengers. As a result the drivers in search of a passenger stop at any point and location leading to congestion.

### ***No parking areas***

Parking areas have not been identified in cities for IPT vehicles. Therefore the drivers often take vehicles home, and park them on the roadsides without any security. This results in theft and vandalism of these vehicles.

### ***No access to restrooms, drinking water facilities***

Another consequence of the lack of recognition of the profession is the lack of restrooms, shelters, toilet facilities, or even access to drinking water. This often leads to health problems, deep fatigue and poor driving habits among drivers.

### ***No access to repair workshop***

Since this sector is not formally recognized by the government, no workshops have been developed for the vehicles. Even for a small technical problem the drivers are forced to take the vehicles to private repair shops. This in turn leads to higher maintenance cost. Also the local shops do not have the technical expertise required to maintain these vehicles which leads to greater breakdown of vehicles or usage of more lubricants leading to greater fuel emissions etc.

### *Lack of gas stations*

Even though orders have been passed by High courts for maintaining the emission standards by usage of natural gas/ LPG / CNG, cities do not have sufficient refilling stations to cater to the demand as in case of Kolkata, Ranchi etc., which is why drivers often refuse to carry passengers to certain locations.

### **Lack of social benefits for the drivers**

The social status and living conditions of the IPT drivers are precarious and this has an impact on drivers' behavior and driving practices.

### *No social benefits*

As has been discussed in the earlier section, this sector is unorganised in most cities and the drivers work individually. It is very rare that they get any social benefits from the unions or NGOs. They are also not provided help from the government in the form of training, insurance, medical facilities, pension, education, etc. The only case where the government is providing subsidies is to help SC/ST to purchase vehicles.

### *Long working hours*

To earn their daily wages and to cover the operating expenses the IPT drivers work for more than 12 hours a day to earn their living, resulting in constant exposure to pollution on roads and poor health conditions. This also leads to weakness, tiredness and thus unsafe trips.

### The role of the Unions/NGOs

Auto unions are not registered and their functions and organisation structures are also not defined. They do not address the problems of the drivers for which they have been formed. Though a few NGOs are working for the welfare of the drivers such as NyayaBhoomi, Rickshawale.Com etc, very few drivers know about them and are able to gain benefits from these organisations.

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**Outdated technology to meet emission standards**

Three wheelers play a crucial role as an intermediate public transport. Their annual sales surpass over half a million. Their rapidly increasing numbers in cities are resulting in greater levels of pollution and greenhouse gas emissions. Therefore, there is a need to pay urgent attention to further reducing their emissions and fuel consumption to keep up to the standards. (Refer to Chapter 6 for more details on issues, vehicle technology and emission standards of the existing IPT system)

**Lack of usage of modern technology (ITS)**

IPT, unlike cabs and private vehicles, generally don't use modern technologies and face several problems like:

***No equal distribution of the vehicles***

IPT vehicles are usually concentrated in one place, where the probability of getting passengers is the highest, whereas some areas are not covered at all. This lack of proper fleet management leads to high waiting time for the passengers in non-covered areas and more competition among the drivers in high demand areas. IPT vehicles have a dead mileage of about 40 km a day looking for passengers, causing severe losses in terms of fuel usage.

***Practice of bribes by the Traffic Police***

The traffic Police often charges a penalty for not wearing uniforms, not using the meter, violation of routes, lack of documents etc without giving a proper challan or receipts. This leads to violation of laws and loss of valuable revenue earning from the government side.

***Lack of security for passengers***

IPT is not considered as a safe means of transport as none of the vehicles can be tracked. There is thus a lack of security for passengers, especially females and elderly users. Though an attempt has been made by Delhi DIMTS for 2,500 autorickshaws by installing GPS and emergency buttons in each IPT vehicle, the control room has not been set up yet. So no benefits are gained until now.

***Overcharging by drivers***

One main issue that commuters keep complaining about is the fact that IPT drivers often refuse to switch on the meter and prefer to fix the fares themselves. Commuters end up paying much more than the official fares fixed by the RTO. In areas where no other modes of transport are available, the commuters do not have an option and end up paying the fare fixed by the driver.

**Lack of financial support**

One of the main issues highlighted in the surveys of drivers for all 19 cities is the lack of financial support to the drivers to purchase the vehicles and become owner themselves. The following are the main reasons:

1. Stringent conditions to get loans from nationalised banks
2. Long procedure
3. Recourse to private banks

The details have been given below:

***Stringent Conditions to get loans from nationalised banks***

Most of the drivers of IPT vehicles rent them from their owners as they are financially weak and the process of getting loans is not favourable for them. In India, the nationalised banks lend money at 12.5% to 15.5%; however the applicant needs to provide the following documents.

- Down payment of 20 to 25% of the total vehicle cost
- Income and expenditure statement for the last 6 months based on which the bank calculates viability the borrower's capacity to pay the installments on time
- Address proof: Water or electricity Bill, rental agreement, ration card
- Bank account in the same bank with a minimum deposit of Rs around 1,000
- Quotation (Performa invoice) from the Auto Dealer of the total costs
- A valid Auto Cab Drivers License Badge/Display card
- A valid auto Cab permit or endorsement letter from RTO/RTA
- Photo identification with signature: passport, voter card

- Passport size photographs

Considering the poor financial conditions of the drivers, they are unable to provide all the documents and hence their request for a loan is often declined.

### *Long procedure*

In case of nationalised banks, the process of getting a loan can take more than one month and in most of the cases, the drivers cannot afford to wait for so long. Many of them are seasonal workers who come to the city to work for a few months and cannot afford the loss of time. Sometimes they contact a middle man who acts as a guarantor and helps them with taking loans from the banks in a shorter time frame. In return the middleman earns a commission.

### *Recourse to private banks*

In the absence of easy access to loans from nationalised banks, most drivers resort to private banks for loans. Although these banks have a higher rate of interest (20 to 25%), their requirements in terms of documents is much lesser, and they offer a faster procedure for sanction of loans. However the flip side of this is that in case of late / delayed repayment, the vehicle is seized by the bank. The documents required by the private banks are categorized into two groups.

#### **Mandatory documents**

- Address proof
- Photograph of borrower and guarantor

#### **Optional documents**

- Last 6 months' bank statement
- Loan repayment record (if any)
- Registration Certificate (RC) book photocopies for vehicles owned

**Lack of ownership / institution for the IPT vehicles**

The Central Motor Vehicles Act does not recognize the institution responsible for the discharge of its function and responsibility towards the IPT vehicles. Other than the RTO issuing permits for the vehicles and traffic police looking after the rules and regulations on the roads, this sector is considered to be unorganised and completely privately owned. Therefore, no recognition is given by the government in organising the system like improving the fleet, financing the vehicles, improving the drivers working and social conditions when compared to the city bus services.

**Conclusion**

Thus, it can be said that though IPT is an important mode in all cities across India, this sector being unorganised and not recognized by the government is facing one of the biggest challenges in the times to come. Therefore, in order to upgrade the service and IPT vehicles there is a need for improvement that must be brought to the sector before it is too late and their importance is lost.

## 6. IPT TECHNOLOGY AND EMISSIONS STANDARDS

### Background

City commuters are increasingly using IPT as the primary mode for daily trips. These vehicles are playing an important role in filling the gap of public transport or acting as feeders to the public transport system. However, users and city officials like RTO, traffic police etc are of the opinion that these vehicles cause pollution, often leading to severe heart diseases among commuters and drivers. The number of IPT vehicles are increasing as it is evident from the production of IPT vehicles, which has increased threefold in the last decade. (Figure 6-1)

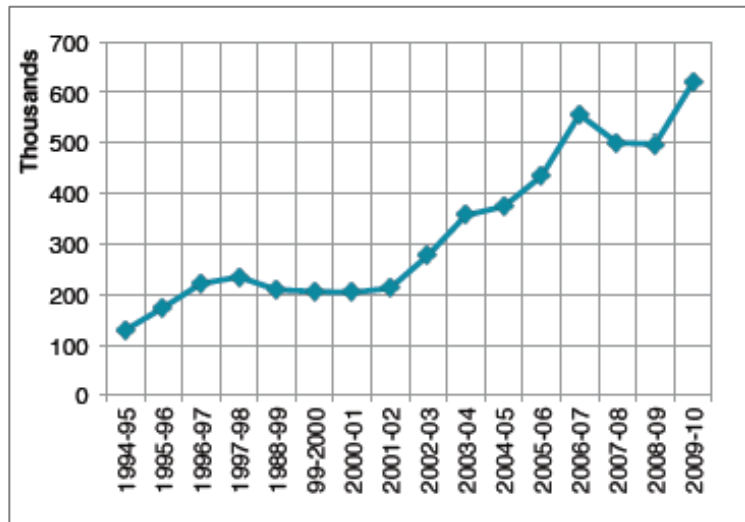


Figure 6-1: Annual production of 3 wheelers in India in the last five years (ACMA 2011)

At present, the total production of three wheelers is about 8 lakh 39 thousand (SIAM, 2012-2013) and of these, a large number are exported. (Figure 6-2)

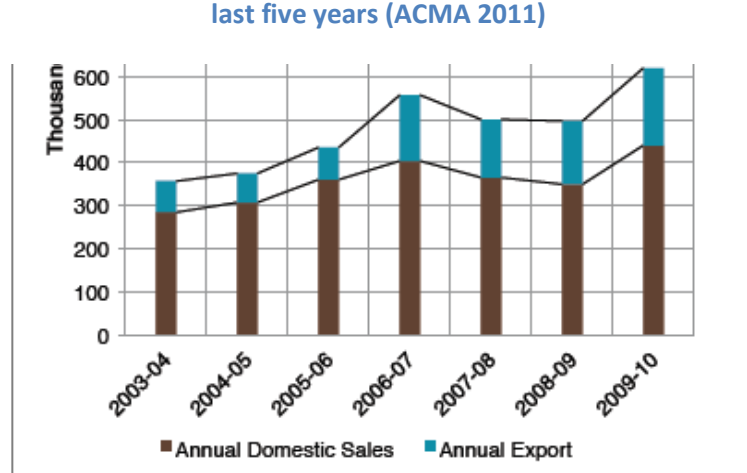


Figure 6-2: Domestic sales and exports of 3 wheelers (SIAM, 2011)

Considering the rise in demand for IPT vehicles, upgradation of their technology and standards is needed.

This chapter focuses on understanding the existing IPT vehicles’ technology and emission standards and identifying the issues regarding them.

### Fuels used in IPT vehicles

The IPT vehicles with less than 4 seats until very recently are almost equally divided between diesel and petrol. The vehicles designed to run on CNG and LPG is derived from petrol versions. The IPT segment of less than 4 persons accounts for practically all CNG and LPG technology (Figure 6-3).

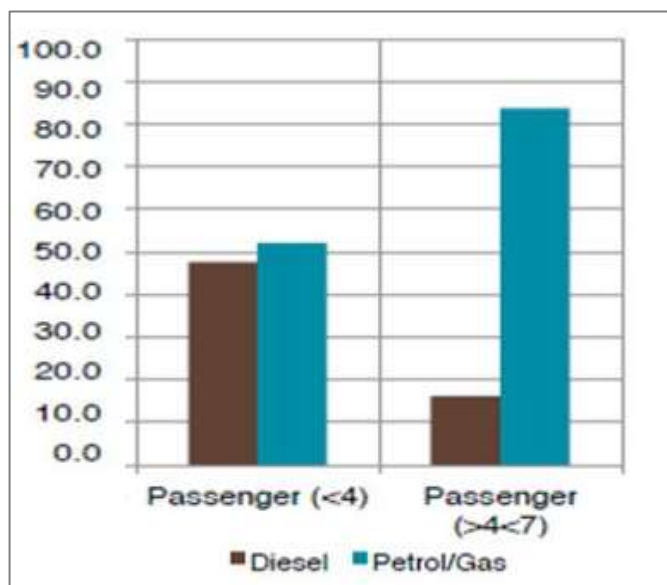


Figure 6-3: Relative proportions of diesel and petrol/gas in different categories (SIAM, 2011)

### Emission characteristics

Since the two-wheelers (75% in 2007-08) and IPT vehicles – both autos and tempos (4% in 2007-08) constitute about 80% of the total number of vehicles in India, their emissions also form a significant proportion of the total pollution caused by vehicles.

The main pollutants of two-stroke engines are the hydrocarbons (HC) and particulate matter (PM), whereas four-stroke engines result in higher NOx emissions but lower PM, HC and fuel consumption (Figure 6-4).

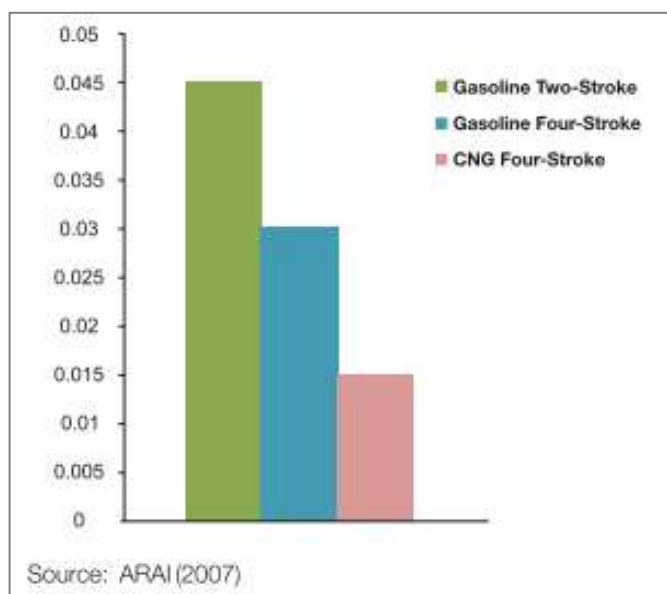


Figure 6-4: Comparison of PM emission factors (g/km) of autorickshaws (post 2000 models)



The key emissions from the IPT vehicles in the Indian cities are the emission of particulate matter of aerodynamic diameter of less than 10 microns (PM 10) from the two-stroke engines. Many of these emissions undergo further reactions in the atmosphere and lead to the depletion of ozone and increase smog levels. Example of PM 10 emissions in Delhi is given in figure 6-5 below. From the figure it can be seen that PM 10 and HC emissions from three-wheeler and two-wheeler are the greatest.

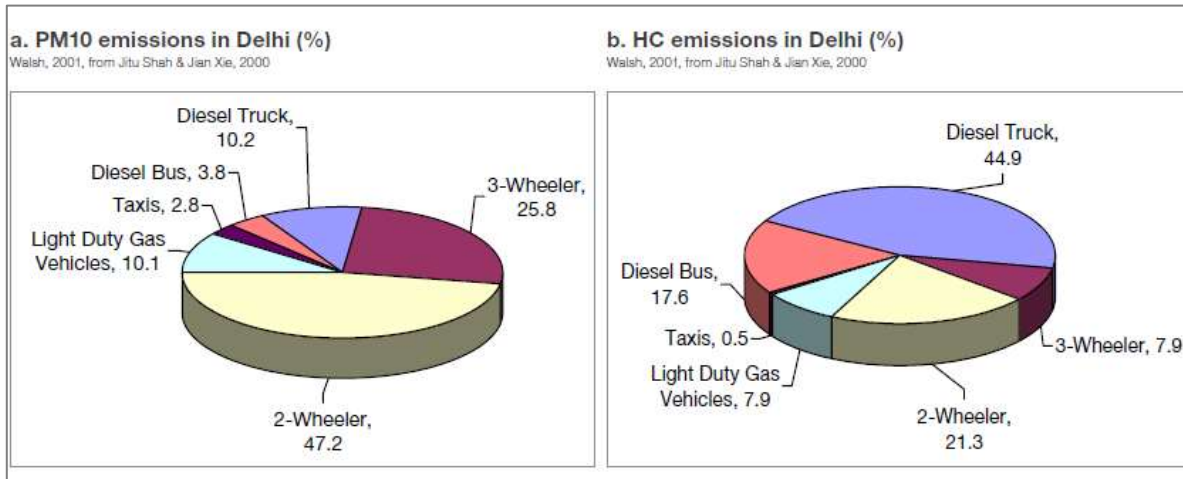


Figure 6-5: PM and HC emissions in Delhi

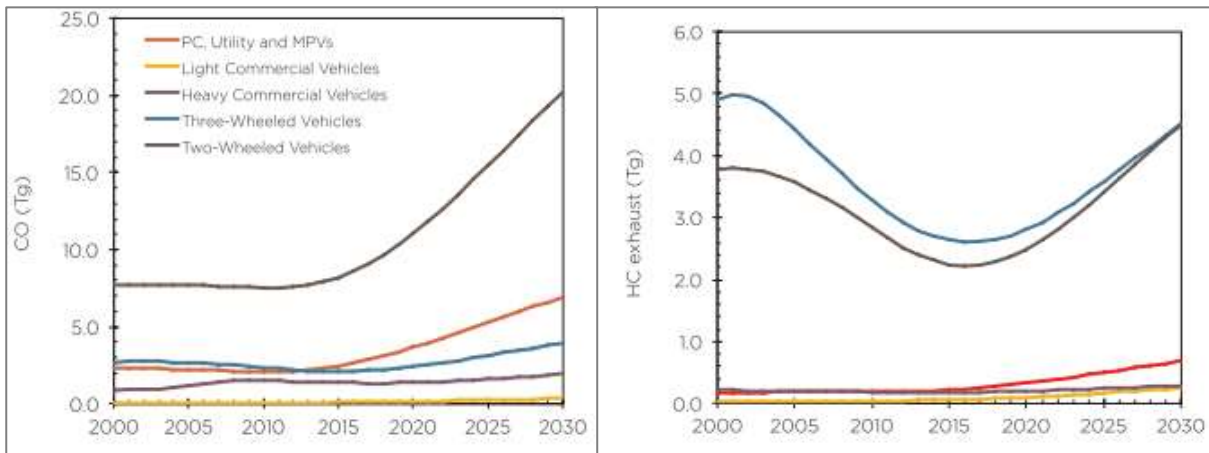


Figure 6-6: HC and CO emissions ICCT's India Emissions Model, in 2010

Studies from the early 2000's show that two wheelers account for 70% of the total PM 10 emissions. In India the share of HC and CO from two- and three-wheelers are also higher than HC and CO from other motor vehicles. According to ICCT's India Emissions Model, in 2010 the share of HC and CO was 92 and 74%, respectively (Figure 6-6).

According to a study by the Centre for Science and Environment (CSE), Indian three-wheelers were found to contribute between 6 and 24% of total automotive PM in five large

cities, significantly more than their share of vehicles. The large share of two-stroke engines combined with poor maintenance practices contribute to such large emissions from three-wheelers. Other reasons cited for high emissions is the excessive use of inferior quality lubricating oil. (ICCT, 2009). Additionally, long hours in congested traffic conditions further add to the emission from these vehicles.

### Major factors exacerbating emissions

- 1) **Misuse of lubricant-** Both quantity and quality of lubricant used affects the level of hydrocarbons and particulate emissions from two-stroke engines. Vehicle manufacturers recommend adding 3% lubricant for three wheelers. But drivers use more due to lack of knowledge. As a result, it increases combustion chamber deposits and foul spark plugs. It is recommended that three wheelers should use 2T oil. But drivers use mineral oil or new or recycled engine oil, which are cheaper, resulting in a greater deposit build up and higher emissions.
- 2) **Inadequate vehicle maintenance-** Three wheelers are mostly used commercially and require frequent maintenance. However, since most vehicles are rented by the drivers, they often fail to maintain their vehicles. The owners also do not feel solely responsible for the mechanical condition of the vehicle. Recent studies in the US indicate that poorly maintained vehicles (20% of all vehicles on the road) contributed about 80% of vehicular emissions. Also poorly trained mechanics contributed to the poor mechanical state of the vehicles.
- 3) **Adulteration of gasoline-** Emissions from all gasoline vehicles are exacerbated by the adulteration of gasoline with kerosene. Kerosene has a higher boiling point than gasoline and thus more difficult to burn. As a result more deposits build up in the engine and more unburned hydrocarbons are emitted in the exhaust gas.
- 4) **Lack of catalytic converters-** Catalytic converters—installed in passenger cars in many parts of the world where unleaded gasoline is readily available—cannot be used to convert a high proportion of hydrocarbons in two stroke engines because current designs result in greater heat of reaction and the sintering of precious metals, which deactivates the catalyst. The tendency of two-stroke engines to misfire under low load conditions further aggravates the problem of catalyst deactivation.

### Impacts of emissions:

Two major impacts are:

- 1) **Health Impacts**-Research studies in various cities and countries have shown that PM 10 and PM 25 are extremely hazardous in nature. These particles are associated with respiratory symptoms, asthma, changes in lung function and premature death. The health impact of particulate matter increases as the size of the particle diminishes.
- 2) **Global warming impacts**- Three greenhouse gases emitted by vehicles—CO<sub>2</sub>, Methane, and nitrous oxide—are believed to have the potential to increase global warming.

### Current Emissions Standards

Emission standards for motor vehicles, including autorickshaws, are stipulated by the Central Pollution Control Board (CPCB) under the Ministry of Environment and Forests (MoEF). Based on the type of vehicle fuel used, these standards are defined for criteria pollutants including carbon monoxide (CO), hydrocarbons (HC), Nitrogen Oxides (Nox) and particulate matter (PM)

The emission standards for gasoline vehicles in India are first put in place in 1991 for CO and HC pollutants. These norms were progressively tightened in the subsequent years (1996, 2005, 2010) with HC standard and NO<sub>x</sub> (HC + NO<sub>x</sub>) standard. The progressive standards for gasoline IPT vehicles are given in Table 6-1.

**Table 6-1: Emission standards for gasoline IPT vehicles in India, g/km**

Year	CO	HC	HC + NO <sub>x</sub>
1991	12-30	8-12	-
1996	6.75	-	5.40
2000	4.00	-	2.00
2005 (Bharat Stage II)	2.25	-	2.00
2010 (Bharat Stage III)	1.25	-	1.25

Source- SIAM(2011)

IPT vehicles in some cities run on diesel. Table 6-2 shows the emission norms that have been stipulated for diesel autorickshaws in cities. Since diesel fuel is a major source of PM

emissions, it is included in these standards—unlike standards for gasoline vehicles which do not include PM.

**Table 6-2: Emission standards for Diesel IPT vehicles in India, g/km**

Year	CO	HC + NO <sub>x</sub>	PM
1991	14.3	20	-
1996	5	2	-
2000	2.75	0.97	0.14
2005	1	0.85	0.10
2010	0.5	0.5	0.05

Source- iTRANS (2009)

Alternative fuels such as compressed natural gas (CNG) and LPG are increasingly being used in the IPT sector. To their economic and environmental benefits, the emission standards for IPT running on these fuels are stipulated for two categories: 1) newly manufactured vehicles built to run on these fuels and 2) in-use gasoline vehicles that are retrofitted with CNG or LPG kits. For newly manufactured CNG or LPG vehicles the emission standards are the same for gasoline IPT vehicles as shown in Table 6-3 except for the following modifications (SIAM, 2011). For CNG vehicles HC is replaced with non methane hydrocarbons (NMHC). For LPG vehicles HC is replaced by reactive hydrocarbon. (RHC)

For IPT vehicles retrofitted with CNG or LPG kit, the emission standards are the same as those for in gasoline vehicles, except that HC should be replaced with NMHC for CNG and RHC for LPG. (Table 6-3)

**Table 6-3: Emission standards In use gasoline/CNG/LPG IPT vehicles**

Vehicle Type	Co, % Vol	HC, ppm
Three-wheelers, (2/4-stroke), pre-2000	4.5	9,000
Three-wheelers, (2-stroke), post-2000	3.5	6,000
Three-wheelers, (4-stroke), post-2000	3.5	4,500

Source- iTRANS (2009)

**Issues from current emission norms are as follows (Shah and Iyer)**

- The emission norms are combined for HC and Nox and are not applied separately for these pollutants. This is particularly an issue when it comes to controlling NOx emissions from four stroke IPT vehicles which are able to meet the combined standards due to their lower HC emissions even though they have high Nox emissions.
- There are no emission norms for particulate matter emissions from gasoline IPT vehicles (Shah and Iyer, 2004).
- There are no norms for greenhouse gases from IPT vehicles.

India has been actively participating in the activities of the UNECE in the development of global standards for two-wheeled vehicles. UNECE has now issued the Global Technical Regulation No 2 (GTR 2) prescribing a world harmonized test cycle (WMTC) and a few alternative sets of emission limit values for the participating countries to choose from. As a part of its commitment to transpose the GTR 2 into the country's regulations, the government, in December 2010, issued a draft regulation to be used as an alternative to BS III. The standard adopted in this regulation prescribes a combined limit for HC and NOx to cater to the requirements of engines employing lean air-fuel ratio calibration that improves fuel efficiency but leads to higher NOx emission. Reducing NOx emission would necessitate the use of richer air-fuel mixtures causing deterioration in fuel efficiency, and, concomitantly, the increase in CO2 emission. Reducing NOx emission while retaining the advantage of low fuel consumption and CO2 emission requires the adoption of advanced technologies that are not yet well established for use on small vehicles.

**Future Emission standards**

According to feedback received from the SIAM (*Gandhi 2011*), the next stage of emission regulation (BS IV) will be scheduled for introduction by the year 2015. The next stage of emission regulation (BS V) is scheduled to introduce in the year 2020. Regarding the progression of emission standards for three-wheelers, SIAM feels that this category of vehicles does not have parallels in other countries and as such there are no references available for India to consider while planning for future norms. Besides, since WMTC does not cover three wheelers, it feels that a new test cycle may have to be developed. The

manufacturers are having internal discussions to evolve a road map for emissions from three wheelers.

Emission limit has been proposed for two wheelers in the year 2015 and 2020. In this case it was visualized that there would be a 25 % reduction in CO from BS III to BS IV. From BS IV to BS V reduction of 40% was assumed. Similarly for HC and NOx, a 25% reduction was assumed and 35% reduction from BS IV to V. In case of three-wheeled vehicles, it is proposed to apply broadly the same percent reductions to the prevailing emission limit values as per BS III limits (*MoRTH 2009*). Table 6-4 given below shows the suggested emission limits for 3 wheelers- 2015 and 2020.

**Table 6-4: Suggested emission standards for 3 wheelers**

2 or 4 stroke	2 or 3 wheeler	Stage	Emission Standards, (g/km)			Drive cycle	Durability Test, km	DF
			CO	HC+NOx	PM			
2&4 SI	3	2010	1.25	1.25		IDC	30000	1.2
2&4 SI	3	2015	0.94	0.94		IDC	30000	1.2
2&4 SI	3	2020	0.66	0.66		IDC	30000	1.2
2&4 CI	2&3	2010	0.50	0.50	0.05	IDC	30000	1.1
2&4 CI	2&3	2015	0.38	0.38	0.038	IDC	30000	1.1
2&4 CI	2&3	2020	0.26	0.26	0.025	IDC	30000	1.1

In order to understand whether the present day (BS III) 2 wheeler vehicles could meet the 2015 and 2020 standards, a test was conducted. During the test it was found that as limits rose of CO and HC+ NOx, the number of vehicles passing the test declined. Especially in case of HC +NOx emissions, none could pass the test. However the conclusions drawn in respect of two-wheeler engines could be considered as generally applicable to three wheeler engines also. A different approach will be required in case of diesel-powered vehicles, as there was no data available for three-wheelers available in the public domain.

### Engine Technology

The engines in these vehicles are located in a compartment behind the passenger's seat. The basic petrol engine is similar to that of a two wheeler except for the difference in gearbox and transmission. The diesel versions use single cylinder engines less than 500 cc

displacement. The petrol and CNG/LPG engines used in three wheelers can either be 2 stroke or 4 stroke. About 70 % of petrol vehicles are two stroke (Iyer, 2003). Typical specifications of Bajaj are given below. It is seen that all engines are single cylinder type and ranges between 145 cc and 175 cc. (Table 6-5)

**Table 6-5: Specifications of three wheelers produced by Bajaj (2011)**

Description	Petrol	Petrol	Petrol	CNG	LPG	Diesel
<b>Fuel Control</b>	Direct Injection	Carburetor		Regulators		Indirect Injection
<b>Engine Type</b>	2-Stroke cooled, SI*	forced air	4-stroke forced air cooled, SI*			4-stroke, air cooled CI#
<b>Displacement, cc</b>	145.5		173.5			416.6
<b>Compression Ratio</b>	11.0 ± 1.0:1	10.0 ± 0.7:1	9.0 ± 1.0:1			24.0 ± 1.01
<b>Max Power, kW @ RPM</b>	6.8 kW @ 5000 RPM	5.2 kW @ 5000 RPM	6.0 kW @ 5000 RPM	4.8 kW @ 5500 RPM	5.7 kW @ 5500 RPM	5.0 kW, 3000RPM
<b>Max Torque, NM @ RPM</b>	14.91 NM @ 3500 RPM	12.17 NM @ 3500 RPM	11.5 NM @ 4000 RPM	9.3 NM @ 2500 RPM	11.5 NM @ 3500 RPM	18.7 NM @ 2200 RPM (±200)

The proportion of 2 stroke engines in three wheelers continues to be high. The first set of emission standards was set up in 1991, which were made strict during 1996.

**Technology used in 1996**

**1. Solutions for 2 stroke engines**

At 1996, the standards set in were met by use of lean air fuel mixes, along with improvements in design to reduce emissions of HC and CO. The improvements in designs include redesigning ports and exhaust system, higher compression ratios, electronic ignition etc.

**2. Lean Air Fuel Mixes for four stroke engines**

Manufacturers have been tuning their engine for lean air fuel mixtures, which in addition to improving the fuel efficiency, lead to a desirable reduction in the

emission of Carbon Monoxide (CO) and Unburned Hydrocarbon (HC). The adverse impact of using lean air-fuel mixture ratios is that it leads to an increase in the emission of Oxides of Nitrogen (NO<sub>x</sub>). So far, this has not been a matter of great concern to the Indian manufacturers since the Indian emission standards for two-wheelers prescribe a composite limit for HC+ NO<sub>x</sub> in addition to a limit for CO. Since the HC emissions by 4-stroke engines are inherently lower than those of 2-stroke engines, they are able to meet the composite HC+ NO<sub>x</sub> limit even if the NO<sub>x</sub> emission is on the higher side.

### Technology used in 2000

The emission standards introduced in 2000 were among the most stringent in the world and led to the use of oxidation catalytic converters on all 2-stroke engines and an increased switch to 4-stroke engines.

#### 1. Oxidation type catalytic convertors

Improvements in engine design and optimization of performance characteristics of 2-stroke engines were not sufficient to reduce the CO and HC+ NO<sub>x</sub> emission to meet with the limits enforced since 2000. This necessitated the use of oxidation catalytic converters to bring about further reductions in CO and HC emissions. However the engines, continued to use simple carburetors that did not enable an accurate control of the air fuel ratio required for efficient operation of the catalytic converter. These convertors operated at an estimated conversion efficiency of around 50% on an average. Some of the four-stroke engines still required the use of oxidation catalytic converters to meet standards of 2000 and 2005. Also the introduction of controlled quantities of secondary air in exhaust helps increase the supply of oxygen in exhaust thereby reducing emissions. But this system is not used in Indian system.

#### 2. Shifting from 2 stroke to 4 stroke

From 1999 to 2001, when a shift was taking place from 2-stroke to 4-stroke for 2-wheelers, Bajaj launched 4-stroke three-wheeler engines. However, this initiative did not receive a good response from the market as the new technology was expensive



and had a higher complexity of maintenance Table 6-6 below gives comparative advantages and disadvantages of 2 stroke engines in three wheelers.

**Table 6-6: Performance comparison of two stroke and four stroke autorickshaws**

Indicator	Advantages of Two-stroke over Four-stroke Engines	Disadvantages of Two-stroke Engines over Four-stroke Engines
Capital Cost	Lower capital cost	
Power and Torque	Higher power and torque for the same engine size/weight	
Mechanics	Mechanical simplicity, which results in the relative ease of maintenance	
Engine size	Lighter and smaller size for the same power and torque	
Emissions	Low NOx emissions	Higher PM, HC and CO <sup>2</sup> emissions
Fuel Economy		Lower fuel economy due to the “scavenging losses”
Noise		Louder noise

Source: Shah and Iyer (2004)

The major advantages of 4 stroke engines are lower emissions and noise.

### **Future Technology**

According to Ntziachristos et al. (2009), reducing the “engine-out” emissions by improving the fuel delivery was the primary approach. This involved a switch over from carburetors to fuel injection on both 2-stroke and 4-stroke engines.

A precise control of the air-fuel ratio, a good mixture preparation and complete combustion of the fuel are the basic requirements for improved engine performance, reduced emissions and superior fuel efficiency. Earlier air fuel mixture management was done by using the carburetors. This could not keep pace with the development and made way for the advent of electronically controlled engine management. For four wheelers, electronically managed fuel injection has become the norm. However, small two and three wheelers still rely on conventional carburetors.

### *Fuel ingestion systems for two stroke engines*

There are two types of fuel ingestion

- a) **Air-assisted Direct Fuel Injection for two-stroke engines** - Air-assisted direct fuel injection redesigns the conventional two-stroke cycle in such a way that only air pushes the exhaust gases out during the scavenging process. The mixture of fuel and lubricant is added directly into the combustion chamber once the exhaust valve is closed. Air-assisted direct fuel injection uses compressed air for this task. Proper control for this redesign is achieved with the help of an on-board microprocessor. Air assisted direct injection improves fuel consumption by 30 to 60% over carbureted engines depending upon engine size and duty cycle (Gambino & Iannaccone, 2001), (Archer & Bell, 2001), (Govindarajan, 2005). Direct injection is currently available in small motorcycles in Europe and is being developed for the Indian market (Iyer, 2011). The cost of a direct injection system for small two-stroke engines has been estimated at around \$40 i. e., Rs 2,400 approx. (Meszler, 2007). Direct injection is also available as a retrofit for two-stroke three wheelers (ICCT, 2009). While the injection process helps bring down the emission levels significantly, meeting the future limits proposed for BS IV and BS V may require the use of catalytic converters over and above fuel injection system.
- b) **High pressure direct injection-** As against the air-assisted fuel injection, the high-pressure direct injection does not allow a good atomization of the fuel, as well as need to maintain high pressure etc.

### *Fuel injection options for four stroke engines*

- a) **Air- fuel management: Electronic carburetor-**Traditionally, four stroke engines use inexpensive mechanically operated carburetor technology for air-fuel control. However, an electronic carburetor is a revolutionary step between the carburetor and port fuel injection. The electronic carburetors provide better fuel control through a solenoid valve. An oxygen sensor or feedback signal is used to keep the air fuel ratio close to complete combustion conditions. Electronic carburetors costs are around \$ 40 i.e., Rs 2,400 (Iyer, 2011). It is seen that this reduces HC and NO<sub>x</sub> by about 75% and 40%, respectively.
- b) **Electronic Port fuel injection-** Use of electronic fuel injection, such as Port Fuel Injection, can help improve the consistency of fuel delivery that can improve transient response.

Since fuel metering is done electronically, this fuel injection system makes it possible to improve the conversion efficiency of oxidation catalytic converters and also makes it possible to use the three-way catalytic converter, which requires an accurate control on the air-fuel ratios. The use of port fuel injection helps deliver a better fuel efficiency while maintaining the performance characteristics.

- c) **Direct Injection in 4 stroke-** Use of direct injection as against Port Fuel Injection, allows the introduction of a stratified combustion system, which has a good potential to improve fuel efficiency. But this is not used as it is much more expensive.
- d) **Air assisted direct injection in four stroke engines-** Researchers of the above study believed that many of the specific challenges related to the application of DI to small displacement motorcycle engines can be addressed with an air-assist DI combustion system. There has been 10% fuel economy improvement and low NO<sub>x</sub> levels.

### Three wheelers in the Indian market

The basic approach to meet the emission standards for diesel-powered three-wheelers has been one of the parameters for optimization of injection and tuning and finer calibration of the engine. Except the Bajaj three-wheeler, which uses the Kubota indirect injection engine with a patented three-vortex combustion chamber, the other models use direct injection engines that are more amenable to the control of emissions. None of the diesel engine models use automatic fuel injection timing control, catalytic converters or exhaust gas recirculation (EGR).

### *Bajaj Auto's Re GDI Launch – India's First Direct Injection Two-Stroke Engine*

Bajaj Auto launched a new variant of its auto-rickshaw, in Mangalore (*Bajaj 2011*). The new petrol-engine three-wheeler incorporates gasoline direct injection (GDI) technology, which allows the vehicle to achieve very low emissions figures, making it cleaner than auto-rickshaws that run on LPG or CNG. In addition to being more eco-friendly than regular petrol engines, these also deliver up to 33% better fuel efficiency, hence reducing the running costs for operators. This new autorickshaw is priced at Rs 92,000 and a deluxe version at Rs 1.17 lakh, 'on the road' (lakh = 100,000). According to Duret (*2011*), the Bajaj RE-GDI is the only three-wheeler in the world with a DI 2-stroke (*Bajaj 2011*).

The challenges posed by the increasing pressure in different parts of the world to bring about a drastic reduction in emissions from small engines are compelling researchers to look for advanced solutions that have not been explored in the past. The researchers seem to be targeting the large Asian markets like India, which use a large number of small 4-stroke engines and where low cost is a prime consideration. Many researches are still underway and will reach the market soon.

### Alternative to two-stroke gasoline engines

Cleaner alternatives include four-stroke engines and engines powered by LPG, CNG and electricity.

A four-stroke vehicle has significant advantages over a two-stroke vehicle. These include:

- Improved fuel economy (Table 6-7)
- Less pollution (PM, HC, CO<sub>2</sub>, but higher Nox emissions)
- Less noise
- Established technology

**Table 6-7: Fuel economy of two-stroke and four-stroke vehicle engines**

Vehicle type	Engine type	Model year	Engine size (cubic cm)	Laboratory test fuel economy (km per liter)	On-road fuel economy (km per liter)
Scooter	2-stroke	Post-1996	150	55	52
Scooter	4-stroke	Post-1996	150	62	59
3-Wheeler	2-stroke	Pre-1996	150	28	25-27
3-Wheeler	2-stroke	Post-1996	150	28	25-27
3-Wheeler	4-stroke	2000	175	33	30-31

Source: World Bank 2000, from ARAI test of Bajaj vehicles using the Indian driving cycle; Bajaj laboratory tests; ARAI and Bajaj estimates for on-road fuel economy.

Because there is no scavenging loss in a four-stroke engine, a much higher fuel efficiency of 10-20% is achieved. Given that four-stroke engines are an established technology and already available and used in the market, a large shift from two stroke to four stroke gasoline engines presents the greatest opportunity to address emissions from the autorickshaw sector. Four-stroke engines are an improvement over two-stroke engines. This technology is considered more complex and has heavier per power output than two-stroke technology, but it offers better air –fuel control options and a separation of lubricants,

exhaust and intake gas flows. However the issue to consider with four-stroke engines is the higher NO<sub>x</sub> emissions compared to two-stroke engines (Shah and Iyer, 2004). Shah and Iyer, 2004 also report that four-stroke gasoline autorickshaws, although priced higher than two stroke, have lower life cycle costs due to their superior fuel efficiency (10-20% improvement).

### **Vehicles run by LPG**

LPG is a mixture of light hydrocarbons, mainly propane and butanes. It is easier to store and distribute than CNG. LPG also contains reactive hydrocarbons that lower knock limited compression ratio, diminishing engine performance. The main problem is inadequate distribution centres.

### **Vehicles powered by CNG**

Switching to CNG reduces particulate matter and hydrocarbon emissions significantly. The combustion of CNG yields essentially no volatile organic compounds or sulphur oxide emissions. However, CNG is expensive to distribute and store. Studies show that the use of CNG on four-stroke engines (57 km/kg) increases the fuel efficiency more than the 4-stroke LPG. Use of CNG on two-stroke engines does not give fuel efficiency (40 km/kg), though LPG gives a margin of 5% higher mileage. It is evident that CNG and LPG can be used as a solution only in limited areas and not on a wide scale. However, since these vehicles are also required to meet the emission standards prescribed for their respective categories, it will be necessary to carry out further technical developments.

Research done by the University Science, Malaysia provides useful indicators of the directions for further work (Teoh 2008). The research report claims that Direct Injection (DI) of gaseous fuels holds the possibility of achieving improvements similar to GDI (gasoline direct injection). Because gaseous fuels are typically stored and supplied from pressurized tanks, the use of DI systems on them does not require fuel pumps. Also, no pressurized air assistance is required as in the case of gasoline. This should result in a significantly lower cost for the gaseous fuel DI system. Additionally, with only minor adjustments to the system, it may be used with many different gaseous fuels, such as Liquefied Petroleum Gas (LPG), Compressed Natural Gas (CNG), biogas, hydrogen and propane.

## Battery Electric Vehicles

There is a small but growing market for small battery operated electric vehicles. Ten manufacturers amongst them produce about 100,000 vehicles per year that are distributed in 25 different models. Although these constitute only about 1% of the total two-wheeler market, the manufacturers of the electric vehicles are quite optimistic about a faster growth. Also a large package of incentives of the government that are designed to encourage the development of battery operated two, three and four – wheelers are given. No battery electric three-wheeler is in the market, though strong efforts were made a few years ago to develop vehicles with state-of the art technology.

## Issues related to the Technology & Emission Standards

The main conclusion drawn from the 19 city analysis, stakeholder meetings and literature review of the existing situation of vehicle technology and emission standards for IPT are as follows:

### 1. Dominance of two-stroke vehicles in small size cities

The 4-stroke vehicles have till date not received a favorable response due to their higher capital and maintenance cost, and the mileage offered in terms of km/l is not attractive enough. Hence, the proportion of 2-stroke engine in three-wheelers remains high.

### 2. Lack of modern technology leads to increased pollution levels

- i. The basic approach to meet the emission standards for diesel-powered three-wheelers has been of optimization of injection parameters and tuning and finer calibration of the engine. None of the diesel engine models use automatic fuel injection timing control, catalytic converters or exhaust gas recirculation (EGR). This result in greater pollution from the vehicles.
- ii. 2- stroke engines in IPT vehicles continue to use simple carburetors, which have a problem of not obtaining the perfect air to fuel ratio and results in inefficient fuel consumption and greater pollution.

- iii. Lack of Catalytic converters installed in passenger cars in many parts of the world where unleaded gasoline is readily available cannot be used to convert a high proportion of hydrocarbons in two-stroke engines because current designs result in greater heat of reaction and the sintering of precious metals, which would deactivate the catalyst.
- iv. Use of fuel injection techniques and electronic carburetor system for meeting the emission standards like direct injection method in 4 stroke vehicles are still yet to be developed by all manufacturers. Besides some of these modern technologies are a patent of a single company like Bajaj, therefore other companies cannot use the technology and the cost remains high due to monopoly.
- v. The high cost associated with advanced versions of the technologies results in higher sale prices that drivers cannot afford.

### **3. No separate emission standards for 3-wheelers**

- i. There is no emission standards for IPT vehicles in the country, due to the non-availability of reliable data related to ambient air quality. (The exception being Delhi, where in 2009 an emission measurement campaign was held in the capital). Most of the existing emission standards are made for two-wheelers, which apply to IPT vehicles. (World Motorcycle Test Cycle).
- ii. As the NO<sub>x</sub> and HC levels are combined, the 4 stroke autorickshaws can maintain the standards. Also, no standards have been specified for GHG emissions and PM emissions for gasoline engines.
- iii. India's automobile industry sector accounts for about 18% of the total CO<sub>2</sub> emissions in the country; however, like the EU currently there are no standards for CO<sub>2</sub> emission limits for pollution from vehicles.

### **4. No separate fuel efficiency standards for 3-wheelers**

Till date, no fuel efficiency standards have been set up for various classes of vehicles in India. However the manufacturers do declare the efficiency of all

vehicles for marketing purpose. The first efficiency would be for the four wheelers and then it will be slowly applied to three wheelers.

#### **5. Lack of enforcement of standards and norms**

- i. It is mandatory for every vehicle owner to carry a valid Pollution Under Control Certificate. However, in 2011-2012 alone, 50% of auto-rickshaw owners failed to take their vehicles for the annual fitness test (NGO SajagNagarikManch survey), which included the Pollution Under Control Certificate. The traffic police and the RTO are not taking actions against errant drivers.
- ii. A periodic vehicle inspection is required to ensure that vehicles perform optimally in terms of emissions and fuel efficiency, however often it is seen that the RTO and traffic police do not follow rules or strict enforcement on their part resulting in deterioration of performance by vehicles.
- iii. Though the Motor Vehicles Act has a provision to fix the age limit of commercial vehicles, there is no regulation in India to scrap old vehicles that are not fit for use on the road due to resistance from the stakeholders who are adversely affected.

#### **6. No alternative fuel infrastructure in some cities**

With a total of only 527 CNG stations in India, of which 188 are in Delhi, only 41 cities have access to CNG. In contrast the present demand is very high as the cost of CNG is very cheap compared to petroleum, diesel and LPG.

#### **7. Road and Traffic Management**

Inadequate and poor quality of road surface leads to increased vehicle operating costs and also increased pollution. It has been estimated that improvements in road conditions will result in savings of about 15% of vehicle operation costs.



**Conclusion**

The production and sale of IPT vehicles are increasing day by day with the increasing demand in the market. These vehicles contribute significantly to the pollution levels in cities and this is difficult to control as the drivers prefer to use 2 stroke vehicles due to its lower cost of maintenance. Only in a few cities like Delhi, Kolkata etc after the Supreme Court orders the use of CNG /LPG 4 stroke conversion has been mandated. Other cities continue with old variant, especially smaller cities with the use of diesel and petrol as their fuel types. Also, there are no separate standards of emissions developed for these vehicles and last but not the least, the lack of enforcement by the city authorities for vehicles are the some of the major causes of poor conditions of IPT vehicles.

## 7.USAGE OF INTELLIGENT TRANSPORT SYSTEM

### Background

IPT, unlike cabs and private vehicles, generally don't use modern technologies, although it could significantly upgrade the service and solve many issues like unequal dispatch of vehicles, security to passengers, enforcement by traffic police and overcharging by drivers from the commuters. This section deals with solving some of the issues related to IPT operation through the usage of ITS technologies to IPT vehicles.

### Components of ITS

ITS consists of various components, which are further classified into three major components:

#### 1. In Vehicle Equipment

- Passenger Information Service (PIS)
- Global Positioning System (GPS)
- Panic Button
- Smart card reader
- Security Camera Network System
- "Hired/vacant" panel

#### 2. In Control Centre

- Traffic Management System (TMC), GPS and Dial-a-rickshaw system.

#### 3. With the Traffic Police

- Handheld machines (E-Challans)

For more efficiency, these components can be implemented in **two phases**:

- **Phase 1** would consist of the implementation of Panic Button, GPS along with a Traffic Management Centre, "hired/vacant" panel (status panel), and E-challan.
- **Phase 2** would consist of implementation of PIS, Security Camera and smart-card reader.

## Phase 1 Component

### *Implementation for both Autorickshaws and Tempos*

#### 1. Panic Button

This is a system (consisting of hardware, software) that can be used by commuters at the time of any incident/emergency/ accident for getting help. It also helps the Central Control Station to dispatch the police vehicle/ fire brigade/ ambulance at desired location (from where the complaint is received). The button can be installed on the IPT vehicle- auto-rickshaw and tempo, along with the GPS panel for example (Figure 7-1).

This would instil confidence in the users, as the IPT vehicles will be more reliable and safe, and more people will be using it, particularly at night.



Figure 7-1: Panic Button

#### 2. GPS

The Global position system (GPS) or Automatic Vehicle Location System (AVL) is installed as a device, connected to a network of satellites that continuously transmit coded information, which precisely identifies the locations of the vehicles on the ground. This information is then sent to the Central Control Station (CCS) through a wireless communication link. Installation of GPS and GPRS in IPT vehicles could solve many problems related to IPT:

1. It would help check the speed of each vehicle and the central control station can send a communication to the driver in case he is over-speeding or going slow.
2. It will ensure a secure and reliable IPT service.
3. It could help with dispatching the IPT vehicles in the cities.
4. It provides the location of each vehicle continuously and tracks the driver if he takes a longer route or avoids some areas.
5. Such GPS-monitoring devices will also enable passengers to see the driver and vehicle details, speed, and will provide a real time route map on a point-to-point basis.

6. The system can be connected to a bill generation system, which will ensure passengers pay correct fare and also received a receipt at the end of the journey.

GPS would be an essential tool to formalise the sector and organise it under an SPV. Once there is a tool to register the kilometres covered every day, the driver can be paid on that basis. The driver won't have any option but to start the meter, as he will have to submit his meter and the money will be earned accordingly every evening.

GPS systems are now available in cities like Chennai, Bangalore, Delhi and Jaipur but the services are either not sufficient or not fully functional. Devices are available, but due to lack of enforcement and financial support, the drivers are unwilling to install them on their vehicles.

### 3. Traffic Management Centre (TMC)

In general, a Traffic Management Centre (TMC) is where data is collected, analysed and collated. TMC enables information about the transportation network to be collected, processed and integrated with other control data centres to produce useful information which will then be used to monitor the road network operations as well as initiate strategies to improve it.



Figure 7-2: Traffic Management Centre

The TMC provides the following:

- **A control room:** It is also called as a work station; consists of a video wall/ projection screens with various panels and monitors for surveillance and smooth flow of traffic (Figure 7-2). The operators in the workstation confirm the availability of IPT vehicles at various locations and dispatch vehicles, according to the demand, identify location points of breakdowns, identify areas of law violations and send images to the storage area and data processing centre for further actions. This data that relates to

traffic law violation after processing is sent to the police control centre for necessary actions.

- **Storage Area:** This is used for the storage of surveyed videos and images in the control centre.
- **Data Processing and Management Area:** The information received from the control room is processed and necessary action is taken by informing various concerned departments.
- **Police Control Room:** Police officials are present to readily confirm the traffic locations for violations of law so that quick and necessary actions can be taken.

In cities where a TMC/control centre has been set up to manage the city bus service can integrate the system to track IPT vehicles as well. Also, in case a city does not have a TMC, a new one can be set up.

#### 4. Hand-help machines to issue challans by Traffic Police (E-Challans)

The E-challaning system is one of the most effective ITS tools for traffic rules enforcement. To reduce the application of bribes by the traffic police, handheld machines (Figure 7-3) to issue “challans” could be made compulsory throughout India. By the use of this technology, traffic rule violations can be booked in the moment. Plus, once the vehicle number is entered, the machine will also indicate if it is stolen. It also has the potential to reduce bribes, as the process will be more transparent. It will improve the efficiency of the enforcement process. The benefits of the e-challaning system are listed below:



Figure 7-3: E-Challan Machine

1. It removes most of the difficulties of manual enforcement of traffic rules and regulation system.
2. It catches repeated offenders with the exact violation type, and multiple violations can be recorded as well as offense history can be seen.
3. It checks the validity and authenticity of driving license, registration certificate of vehicles and permits.

4. It brings the transparency and helps in curbing corruption.
5. It permits E-payment, through credit/debit cards.
6. It decreases the chances of mistakes.

### *Implementation in Autorickshaws only*

#### **1. Status panel**

Providing autos with status panels, indicating if the vehicle is occupied or vacant, can be helpful for the users as well as the traffic police (Figure 7-4). The panel is connected to the fare meter and once the meter is switched on, the panel shows a hired status.



**Figure 7-4: Status Panel**

The benefits of the panel are:

1. The users can see from a distance if the vehicle is available or not. Thus, they don't have to stand on the road anymore and keep looking for a vacant vehicle.
2. It is also very convenient for the traffic police who can identify from a distance if the driver has switched on its meter or not, without stopping each and every vehicle to check the meter.

## **Phase 2 components**

### *Implementation on Tempos only*

#### **1. Passenger Information System (PIS)**

Passenger Information System (PIS) is an electronic information system which provides real-time passenger information and consists of LCD/ LED based display system. It can be placed at the Tempos' depots/terminals.

1. The Control Centre, which receives the current location of all the rickshaws from the Automatic Vehicle Location (AVL), will disseminate the data received and transfer the relevant information like the route number, and the expected time of arrival (ETA) to the shared tempos' terminal, which has requested for the data.

2. The destination will be displayed in at least two languages- English and Hindi /regional language.
3. The tempos terminal displays will be connected to the control Centre through a wired cable.
4. This display board at tempos terminal will receive the details of the vehicles, which are about to arrive or leave the terminal and display the route number, destination and the expected time of arrival and departure.

The benefits of PIS are as follows:

1. Passengers get real time information: expected time of arrival and departure of the shared tempos.
2. Users can easily figure out which tempo to take, from the clear display of the destination of each tempo.

### *Implementation on both Autorickshaws and Tempos*

#### **1. Smart-card reader**

The use of a smart card (Figure 7-5) on IPT vehicles can help in many ways. It can be a way of integrating the different means of transports. It is also a way of collecting the fares indirectly. The card is charged before boarding the vehicle, and the driver gets paid at the end of the day, according to the number of trips registered by the meter. The data at the end of the day can be transferred to the central computing environment via GPRS or WI-FI. It will consist of:



**Figure 7-5: Smart card reader**

- a. A graphical LCD display screen to show the remaining balance on the card,
- b. Triple coloured LED lights to be present for card interaction/payment confirmation, and
- c. Audio buzzer for confirmation of payment.

The working group on Urban Transport for the 12th Five Year Plan has suggested providing commuters with a Common Mobility Card (CMC). This card would be available throughout India, across all operators of all modes, including parking.

The benefits of the system are:

1. The vehicles will become easier to use and thus more attractive, leading to a decrease in personal vehicle use. Users don't need to have the exact amount of cash with them and they don't have to queue up to get a token or a ticket when they change their mode of transport.
2. Users will benefit from fixed fares.
3. The payment is quicker, leading to less congestion on roads.
4. Money can be collected and redistributed to the drivers, helping formalize the sector, and leading to less competition among the drivers.

## 2. Security Camera

The primary benefit of the camera is to provide safety and security at the IPT terminal and depots and in the parking areas. CCTV cameras also help in:

- Reducing and preventing the deterioration of IPT vehicles at night,
- Assisting the Police in breaking up mafias, and
- Bringing back confidence in IPT to the commuters.

**Table 7-1: Summary Table of the components and their characteristics**

Components	Characteristics
<b>For both Autorickshaws and Tempos:</b>	
• GPS	✓ Locates the vehicle, helps in equal dispatch, more secure
• Panic button	✓ Connected to a police helpline
• Control centres	✓ Linked with the GPS
• Security Camera	✓ CCTV cameras to provide safety and security (to help reduction of crimes and investigation of accidents)
• E-challans	✓ For an easier and more efficient registration of offenses
• Electronic fare collection	✓ Meter with bill generation system or smart-card
• Demand responsive Transport	✓ Booking and reservations by phone/internet/SMS ✓ Route optimization



Components	Characteristics
	✓ Customer pick-up / drop-off management
<b>For Tempos only</b>	
<ul style="list-style-type: none"> <li>• Passenger Information System (PIS)</li> </ul>	✓ Name of the driver, number plate, and speed.
<b>For Autorickshaws only</b>	
<ul style="list-style-type: none"> <li>• Status panel</li> </ul>	✓ Indicates on the top of the vehicle if it is vacant or hired. It helps the users as well as the traffic police

### Benefits to the Stakeholders

The implementation of ITS benefits all sectors i.e., the users, drivers and regulators as it provides a more transparent, safe and reliable system. The key benefits to the stakeholders are summarized below (Table 7-2):

**Table 7-2: Summary Table showing benefits to the stakeholders**

Stakeholder	Benefits of ITS
For the government	<ul style="list-style-type: none"> <li>• An efficient and secure IPT system, essential to ensure smooth mobility in the city and to feed the formal public transport</li> <li>• Less complaints from the users and the Traffic police</li> <li>• Higher incentive to use public transport: higher public revenues, decrease use of private cars, less congestion on roads</li> </ul>
For users	<ul style="list-style-type: none"> <li>• Fixed fares</li> <li>• Increase confidence in the system; freedom to travel at night</li> <li>• No more trouble to find an IPT vehicle, even in a remote area</li> <li>• Ensure that the public is taken to the desired destination via the shortest route</li> </ul>
For operators	<ul style="list-style-type: none"> <li>• Better relationship with the users</li> <li>• Guarantee of a minimum income per day</li> <li>• More efficiency: better laid out, decrease of the waiting time leading to higher daily income</li> <li>• Less trouble with the traffic police</li> </ul>
For traffic police	<ul style="list-style-type: none"> <li>• Quicker process to register offenses and apply fines</li> <li>• Quicker interventions due to complaints easily lodged</li> </ul>

### Limitations for installation of ITS on IPT

1. There are several IPT vehicles that are too old and are going to be scrapped. Hence, drivers don't perceive any incentive to spend the extra amount knowing that it will be used for a very little time.
2. It is observed that ITS tools used for traffic management in a city are implemented without designing proper ITS policy. The proper selection of the tools depends on the level of traffic congestion, the availability of funds, the city characteristics (geography, population, land use, socioeconomic conditions, travel behaviour etc) and the future requirements of the city. In India, there is no defined ITS policy. Some states or cities are implementing ITS tools independently for TMS, without integrating it with other regions or areas within the state.
3. There is a lack of trained manpower and professional companies to sell and install ITS. Very few institutes are teaching ITS with a different focus.

### Solutions

To solve some of the above limitations and challenges stated in section 7.6 the following could be done:

1. Providing subsidy to the owners of these vehicles to partially meet the cost of GPS/GPRS. It could be similar to the case of Delhi NCR where it has already been made mandatory for the drivers to have a GPS in order to get their fitness certificate.
2. The control centre can be set up on a PPP basis where the private party can recover its cost on a monthly basis through the extra transaction cost incurred by passengers for payment of fares. Also the control room for the public transport can also be integrated with the IPT vehicles. In case a city does not have a control room, a new one can be set up.

The 2 other major problems or issues relating to financing of IPT vehicles and Institution for IPT vehicles are described in great details in the subsequent chapters.

## 8. ALTERNATIVE SCENARIOS DEVELOPMENT--FINANCIAL MODEL FOR IPT VEHICLES

Drivers of IPT vehicles face financial issues, as they generally cannot become owners of their vehicles. This is primarily because they are financially weak, and the process of getting loans is tough. The nationalised banks are lending money at 12.5-15.5% with requirements of documents like address proof, pan card details, ration card, previous loan repayment record, guarantor etc required by the banks to finance the loan. Hence the drivers find it easier to resort to private financiers even though they charge a higher interest at 22-25%. Since the earning is low, the drivers are often unable to pay the loans and the vehicles are seized by the bank, and the drivers thus lose their source of income.

Thus, this chapter proposes various options for financing the IPT sector and identifies the merits and demerits of each alternative model.

### Alternative Scenarios developed for financing

To address the issues of financing IPT vehicles, as part of the study 7 options have been suggested, which are as follows:

#### *Option 1- Government self employment scheme*

In Bangalore city, the nationalised banks under various Government schemes like “Government Self-employment Scheme” provide loans for drivers where the Government acts as a guarantor for the IPT operator. Of the total amount, the applicant makes a down payment of 5% to the bank and the government contributes up to 20% (which is to be repaid to the government at a predetermined interest rate – known as “margin money”). The remaining 75% is provided as loan by the bank. The scheme helps the drivers to become owners; however this kind of loan is again affordable by only a few drivers, as the 20% given by the government also has to be repaid later. Table below 8-1 refer to the merits and demerits of the scheme.

**Table 8-1: Merits and Demerits of Government Self Scheme**

Merits	Demerits
<ul style="list-style-type: none"> <li>• Easy availability of loans from the nationalised banks as it acts as a guarantor to the bank</li> </ul>	<ul style="list-style-type: none"> <li>• Burden on government for financing the vehicles</li> </ul>
<ul style="list-style-type: none"> <li>• The government also earns money as the drivers have to repay back the loans with interest at a later period</li> </ul>	<ul style="list-style-type: none"> <li>• Burden of loans still remains with the drivers as later driver has to pay back the loan from the government and bank</li> </ul>
<ul style="list-style-type: none"> <li>• It ensures economic stability to the drivers and family, as their earnings increase after loan repayment</li> </ul>	<ul style="list-style-type: none"> <li>• Large number of documents required to be submitted to nationalised banks</li> </ul>
	<ul style="list-style-type: none"> <li>• Delay in processing of loan</li> </ul>
	<ul style="list-style-type: none"> <li>• Since the bank is not provided with a guarantee for the loan repayment, it does not exhibit a keen interest to introduce new and better schemes</li> </ul>

**Option 2- Nationalised bank financing**

To support the low-income drivers, the nationalised banks can lower their interest rates and request for fewer documents. The mandatory documents required to be submitted could comprise the following:

- Address proof of current residence
- A quotation (Performa invoice) from the Auto Dealer of the total costs.
- A valid Auto Cab Drivers License Badge/Display card
- A valid auto Cab permit or endorsement letter from RTO/RTA.
- A photo identification with signature: passport, voter card.
- Guarantor certified by the government/ SPV

Optional documents that may be requested could be:

- Income and expenditure statement for last 6 months

Also to improve the playback capability of the driver, the loan repayment period may be increased from 5 years to 10 years for drivers who have an average daily income is Rs 200 and 5 years for the drivers whose average income is Rs 500 per day. Table below 8-2 refer to the merits and demerits of the scheme.

**Table 8-2: Merits and Demerits of Nationalised Bank Scheme**

Merits	Demerits
<ul style="list-style-type: none"> <li>It ensures economic stability to drivers and their families, as their earnings increase after loan repayment</li> </ul>	<ul style="list-style-type: none"> <li>Delay in processing of loan in case of nationalised banks</li> </ul>
	<ul style="list-style-type: none"> <li>Large number of documents required by the banks</li> </ul>
	<ul style="list-style-type: none"> <li>Since the bank is not provided with a guarantee for the loan repayment, it does not exhibit a keen interest to introduce new and better schemes</li> </ul>
	<ul style="list-style-type: none"> <li>No social benefits like education, uniforms, medical checkups etc provided to drivers</li> </ul>

***Option 3- Micro financing scheme through nationalised banks:***

A similar scheme was implemented for the cycle rickshaws through the Dipbahan Rickshaw Bank Project, Guwahati. Under this scheme, the rickshaw is provided to the puller through micro-credit loans, and the puller repays the loan at the rate of Rs 25 per day. The rickshaw bank is funded by private companies (ONGC, Indian Oil Company, Hindustan Lever Ltd.), who pay for the advertising space on the back of each rickshaw. This scheme was also implemented in Assam, Lucknow, Banaras, Allahabad and Chennai. Under the scheme, the drivers were provided with uniforms, insurance, licenses, photo ID, training, health care and repair facilities to the driver. However, this scheme cannot be applied as it is for financing IPT vehicles and the cost of the vehicles is higher. The loan repayment period has to be increased from the existing 5 years to a minimum of 10 years for drivers who have a daily income as low as Rs 200 and maybe 5 years for the ones whose daily average income is Rs 500 (i.e. 20% of their expected daily income of drivers if paid daily to the banks). The table below 8-3 refers to the merits and demerits of the scheme.

**Table 8-3: Merits and Demerits of Micro Financing Scheme**

Merits	Demerits
<ul style="list-style-type: none"> <li>• Easy availability of loan from banks</li> </ul>	<ul style="list-style-type: none"> <li>• Problem of expansion as more capital is required by the Bank to meet demand in case of bank project model, and investors take long time to respond so that there is no loss of customers when the service has not been delivered.</li> </ul>
<ul style="list-style-type: none"> <li>• It ensures economic stability to drivers and their families, as their earnings increase after loan repayment.</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of cycle rickshaws is lower than IPT vehicles, therefore easy repayment is possible on a daily basis, but in case of IPT it is not possible to repay in a period of 5 years – 7 years.</li> </ul>
<ul style="list-style-type: none"> <li>• The bank project also provides with social benefits to drivers and its family with clothing, schooling, health care etc</li> </ul>	
<ul style="list-style-type: none"> <li>• Donors to fund to the bank gets 100% tax exemption (Care-India, AIF, MF)</li> </ul>	
<ul style="list-style-type: none"> <li>• Create a positive work environment for drivers</li> </ul>	
<ul style="list-style-type: none"> <li>• Additional revenue through advertisements and services such as mobile recharging, local courier services etc</li> </ul>	

***Option 4- The Ecocabsmodel of Fazlika***

The Fazilka model used a financial scheme where the nationalised bank along with the participation of NGOs made easy loans available at 4% interest rate under the differential rate of interest (DRI) from RBI. This rate is given to priority sectors such as agriculture, education, housing, self-employment ventures. The conditions for sanction of loans are that the family income should not exceed a particular amount fixed by the bank, and the repayment should be made in a period of maximum 5 years. Advertisements can be used for the partial repayment of the loan. The scheme also provides uniforms, insurance, licenses, photo ID, training, health care, repair facilities, to the driver.

Table below 8-4 refer to the merits and demerits of the scheme.

**Table 8-4: Ecocabs model of Fazilka**

Merits	Demerits
<ul style="list-style-type: none"> <li>• Easy availability of loan from banks as NGOs act as a guarantor</li> </ul>	<ul style="list-style-type: none"> <li>• Limited funds available to NGOs as in case of Fazilka</li> </ul>
<ul style="list-style-type: none"> <li>• It ensures economic stability to drivers and their families, as their earnings increase after loan repayment.</li> </ul>	<ul style="list-style-type: none"> <li>• Fazilka model is successful in a small city (approx. 67,000 inhabitants) with only 450 rickshaw operators, and the model may not be applicable in bigger cities like Delhi, where the population and registered and unregistered IPT vehicles are so many.</li> </ul>
<ul style="list-style-type: none"> <li>• The NGO in charge of the scheme is also able to provide with social benefits to drivers and its family with clothing, schooling, health care etc</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of cycle rickshaws is lower than IPT vehicles, therefore easy repayment is possible on a daily basis, but in case of IPT it is not possible to repay in a period of 5 years – 7 years.</li> </ul>
<ul style="list-style-type: none"> <li>• Additional revenue through advertisements,</li> </ul>	<ul style="list-style-type: none"> <li>• The differential rate of RBI is again fixed to priority sectors with fixed cap on income earning and not all parts of society can reap benefits</li> </ul>

#### ***Option 5- Separate private company's formation***

The fifth option could be the creation of private companies such as the “Three-wheelers United India Services Private Limited” (TWUISPL) in Bangalore, which can help the drivers purchase their vehicle by offering them a guarantee. The bank contributes 90% of the vehicle’s cost and the driver is expected to contribute 10%. The TWUISPL gives a refundable 15% of the vehicle as a guarantee. The drivers are then expected to repay the amount in daily instalments for 26 days a month for 60 months. In case of TWUISPL, the financial assistance is provided by local banking partners such as Corporation Bank, PragatiGramin Bank, Canara Bank (recent MoU under the project “Namma auto”) and business partners include ING insurance and Airtel India. Apart from financing, TWUISPL also helps the drivers open savings bank accounts, provide them with life and health insurance, and also provide additional means of revenues for the auto drivers (advertisements in the auto and other services such as mobile recharging, local courier services). With the help of NGOs, the drivers have formed Self-Help Groups, ensuring payment of loans on time.

Table below 8-5 refer to the merits and demerits of the scheme.

**Table 8-5: Merits and Demerits of Separate Private Company**

Merits	Demerits
<ul style="list-style-type: none"> <li>Private companies act as a guarantor and ease the loan process for the drivers.</li> </ul>	<ul style="list-style-type: none"> <li>If the driver is not able to reimburse the loan within 60 months, the vehicle is seized.</li> </ul>
<ul style="list-style-type: none"> <li>It ensures economic stability to drivers and their families, as their earnings increase after loan repayment.</li> </ul>	<ul style="list-style-type: none"> <li>Burden of loans still remains with the drivers as later driver has to pay back the loan from the guarantor and bank</li> </ul>
<ul style="list-style-type: none"> <li>Provide additional means of revenues for the auto drivers, and social benefits.</li> </ul>	<ul style="list-style-type: none"> <li>Limited funds of the organisation</li> </ul>
	<ul style="list-style-type: none"> <li>The profit motive may set in after working</li> </ul>
	<ul style="list-style-type: none"> <li>Risk of sudden shut down of firms if it goes bankrupt</li> </ul>

**Option 6-Corporate financing**

As in the case of Meru cabs or Easy Cabs, financing can be done through the corporate or complete private ownership, in this case the fleet would be owned by the company and it will be rented at a certain cost to the drivers. The table below (8-6) refers to the merits and demerits of the scheme.

**Table 8-6: Merits and Demerits of Corporate Financing**

Merits	Demerits
<ul style="list-style-type: none"> <li>Large capital investments into system</li> </ul>	<ul style="list-style-type: none"> <li>Profit motives</li> </ul>
<ul style="list-style-type: none"> <li>No burden on drivers for purchase of vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Risk of sudden shut down of firms if it goes bankrupt</li> </ul>
	<ul style="list-style-type: none"> <li>Strict contracts of companies as daily payment of higher rent</li> </ul>
	<ul style="list-style-type: none"> <li>No social benefits provided to drivers</li> </ul>



**Option 7- SPV formation**

In many cities across the country, buses are currently operated by an SPV on a PPP basis. i) In this system the buses are run by private operators on a Gross cost model or a net cost model. Under the gross cost scheme, the private concessionaire is allotted routes or areas for operations. The concessionaire provides the buses, arranges for their cleaning and maintenance and provides for the staff. For the services rendered, the concessionaire is paid based on an indexed cost system that has a fixed component based on the cost of the bus, a variable component that factors in the fuel and maintenance costs and a component that deals with the wages cost keeping in mind the consumer price index. The revenue is collected by the SPV who pays to the concessionaire on a kilometre basis. In case of net cost model, the only difference is that the revenue is collected by the concessionaire, who provides a monthly royalty for the permit given to him by the SPV. The same model could be applied for financing IPT vehicles. For this purpose, either a new SPV can be set up or the existing one operating the buses can be given an additional charge of operating the IPT in the city. The concessionaire could be a group of drivers who form a consortium to get the permit for operations. The SPV could act as a guarantor for the consortium to access loans from the bank.

The merits and demerits of the model are given in Table 8-7 below.

**Table 8-7: Merits and Demerits of SPV formation**

Merits	Demerits
<ul style="list-style-type: none"> <li>• Easy loans available as the operator is chosen by the SPV or authority as it is providing a social service to people</li> </ul>	<ul style="list-style-type: none"> <li>• Complex contracting process and high potential for disputes in case of a poorly drafted agreement</li> </ul>
<ul style="list-style-type: none"> <li>• Very low impact on SPV budget and no risk to the budget. Both the operational and demand risks borne by the private operator.</li> </ul>	<ul style="list-style-type: none"> <li>• Demand risk has to be borne by SPV in case of gross contract</li> </ul>
<ul style="list-style-type: none"> <li>• Less time consuming for loan processing as concessionaires already known by the government/SPV</li> </ul>	<ul style="list-style-type: none"> <li>• The SPV will have to make their own arrangements for funds</li> </ul>
<ul style="list-style-type: none"> <li>• Greater revenue, earnings as income is not only earned from the fare box</li> </ul>	

Merits	Demerits
but also other means like advertisements etc	
<ul style="list-style-type: none"> <li>• Greater branding and change of perception for the customers</li> </ul>	

### Recommendation

Out of the seven models for financing, the last model of operations under an SPV seems to be more feasible for the following reasons:

- In Option 1 and 2, the process is lengthy and tedious and requires the drivers to be financially sound to repay the loans.
- In options 3, 4, 5 and 6 the fund provision is limited and there are chances of profit motives setting in or sudden shutting down of the NGOs/ private bodies due to lack of fund. Benefits therefore, cannot be provided on a regular basis.
- In the case of option 7, i.e. the formation of a new SPV/existing SPV in the city, the drivers can form a consortium and the finance will be easily available, as they will be known to the SPV/ government. Besides these, there would not be any risk of a sudden shortage of funds or close down of companies, therefore the system would continue to work.

## 9. INSTITUTIONAL FRAMEWORK FOR IPT

IPT is playing an important role in providing mobility to a large section of the society; still this sector is not formally owned or recognized by the government. Some of the key issues that emerged from the feedback received across the cities are of economic and social stability of drivers, provision of infrastructure, financing and maintenance of vehicles and quality check on standards for vehicles and emission norms, etc. The main cause of these problems is the lack of a strong institutional framework to govern the sector.

This chapter deals with the institutional framework that is needed for improving and upgrading the IPT services and vehicles.

### Alternative Scenario Development for Institutions of IPT

As a part of the study, four options have been explored to create an institutional framework for the system. The advantage and disadvantage of each are specified below.

#### *Option 1: Complete Government Ownership*

The first option would be wherein the IPT vehicles are owned and operated by the government as in case of STUs set up by various states. This could eliminate many problems as the STU can then fix the norms for permissions, follow emissions standards, specifications of vehicles, rent, salaries, social benefits, fix fares, stands, terminals and parking facilities. The merits and demerits of the system are given in table 9-1 below:

**Table 9-1: Merits and demerits of Complete Government Initiative**

Merits	Demerits
<ul style="list-style-type: none"> <li>• IPT would have the status similar to that of public transport and recognition from the government.</li> </ul>	<ul style="list-style-type: none"> <li>• Autocratic set up leading to monopoly in the market</li> </ul>
<ul style="list-style-type: none"> <li>• More organised system, leading to increased reliability and punctuality</li> </ul>	<ul style="list-style-type: none"> <li>• Extra burden for the government as the government has to own and operate another mode of transport</li> </ul>
<ul style="list-style-type: none"> <li>• Reduction of competition between drivers</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of finance to purchase the vehicles</li> </ul>
<ul style="list-style-type: none"> <li>• Provide economic/social stability to the drivers as they would get a fixed</li> </ul>	<ul style="list-style-type: none"> <li>• Burden towards up gradation and maintenance of the fleet</li> </ul>

Merits	Demerits
salary.	
<ul style="list-style-type: none"> <li>Accountability and efficiency of drivers increases, leading to better driving practices and behaviour</li> </ul>	
<ul style="list-style-type: none"> <li>Perception of the user changes as it is government owned.</li> </ul>	

**Option 2: Private ownership**

This model is similar to the ones followed by the Radio Taxi companies, wherein the private operator/corporate can own the IPT vehicles and rent them out at a unique price to drivers.<sup>7</sup> The following are the merits and demerits of the system given system are given in table 9-2 below:

**Table 9-2: Merits and demerits of Private Ownership**

Merits	Demerits
<ul style="list-style-type: none"> <li>Financially strong</li> </ul>	<ul style="list-style-type: none"> <li>Profit making motives</li> </ul>
<ul style="list-style-type: none"> <li>Modern technology, innovations can be implemented</li> </ul>	<ul style="list-style-type: none"> <li>No social benefits provided for drivers</li> </ul>
<ul style="list-style-type: none"> <li>Greater reliability and efficiency for the passengers</li> </ul>	<ul style="list-style-type: none"> <li>Difficult working conditions or contracts for drivers like regular payment of a minimum amount, deposit specific amount etc</li> </ul>
	<ul style="list-style-type: none"> <li>Costly mode of transport as all sections of society cannot afford</li> </ul>
	<ul style="list-style-type: none"> <li>Greater risk to drivers as lowering of earnings may lead the company to close down</li> </ul>

<sup>7</sup>**Easy-cab** (2000): They provide short and long term car rental, 24/7. The vehicles are owned by the company. The owner enters into contract with easy cabs for 4 year term period and has to deposit Rs 50,000 as refundable deposit. After which the car is owned by the driver. But before the four years the driver has to pay Rs 950 daily to company. All the maintenance of cars, cost of the fuel is borne by the driver.

**Meru cab** (2007): Meru cab follows the same pattern, providing the following services: metered "Radio cabs", ready 24/7, e-billing receipt at the end of the ride, use of GPS and GPRS (for passenger safety). All cars are owned by Meru. Each driver is required to pay Rs 800 per day to Meru. The maintenance of cars, cost of the fuel is borne by the driver. The cab drivers are their own employers and they have the freedom on the time of work.

### *Option 3: NGOs/separate private entity ownership*

This model is similar to the structure of the Nirmal foundation (G – Auto), Three Wheelers United India Services Private Limited, Bangalore, which helps bring the autos under the same brand and provides benefits to drivers and users such as 24x 7 services, financing vehicles, training, and many other social benefits to the drivers. The following are the merits and demerits of the system given in table 9-3.

**Table 9-3: Merits and demerits of NGOS/ Private ownership**

Merits	Demerits
<ul style="list-style-type: none"> <li>Provides economic benefits to drivers by acting as guarantors for the banks for getting loans</li> </ul>	<ul style="list-style-type: none"> <li>No financial strength</li> </ul>
<ul style="list-style-type: none"> <li>Provides social benefits like medical claim, training etc to drivers</li> </ul>	<ul style="list-style-type: none"> <li>Provision of infrastructure or introduction of new ideas is limited due to lack of finance</li> </ul>
	<ul style="list-style-type: none"> <li>Less awareness among people</li> </ul>
	<ul style="list-style-type: none"> <li>Profit motives can also set in</li> </ul>
	<ul style="list-style-type: none"> <li>Greater risk to drivers as lowering of earnings may lead the company to close down</li> </ul>

### *Option 4: Setting up New SPV/Functioning of existing SPV*

In the present day system, the RTO issues the permit to the drivers of the autorickshaws. The permit holder in the case of autorickshaws is allowed to retain the revenue generated from the operation of the autorickshaws. But the disadvantages of the system are as follows:

- i. No uniform quality of services
- ii. Danger to public safety of passengers due to rash driving in light of increased competition
- iii. Poorly maintained and unsafe vehicles
- iv. No security for drivers, low salaries, poor working conditions
- v. Difficult to regulate as generally permit holders and persons actually driving the autorickshaws are different

Therefore, to combat the above mentioned challenges the city government may contemplate the formation of a new SPV or allow the already existing SPV (set up for the bus services in the city) to operate the IPT services within suitable PPP arrangements for proper planning and management of operations and services. The two types of PPP model suggested for running the system are the net cost model and the gross cost model system. In both the models, a concession agreement should be executed between the SPV and the operator which include mode of contract, broad terms of engagement, roles and responsibilities and performance parameters. The details of both the kind of model are given below.

### *Net cost model*

In this type of contract the operator is paid/ pays an agreed amount on the basis of the expected difference between the revenue and the total operating costs. This structure involves a subsidy from the authority to the operator if the service is unprofitable. If the service is profitable the operator pays a royalty to the authority. In these contracts, the passenger is viewed as the customer of the operator. All revenues, information and customer relationship belong to the operator. The role of the Transport Authority / SPV is to assure service quality or provide funds to modify the volume, type or price of services that would otherwise have been provided commercially. In this type of contract the cost and revenue risks are of the operator. Under this system the revenue arrangements are complex and needs to be properly described in the contract.

A net-cost contract will be appropriate if:

- The authority wishes to give an incentive to the operator to increase ridership and revenue.
- The authority wishes to give the operator some flexibility to amend routes and schedules to make the network as attractive and efficient as possible.
- A small percentage of revenue is collected off-vehicles.
- Sharing off-vehicle revenue is not seen as a problem.
- The authority wishes to fix the absolute amount of subsidy.

The merits and demerits of the model are listed in table 9-4 below:

**Table 9-4: Merits and Demerits of Net cost model**

Advantages	Disadvantages
1. Risk of revenue leakage borne by the operator	1. Both operational and demand risks borne by private operators
2. Effective incentive for higher ridership	2. Need to specify fares and other details upfront
3. Financial commitments of public entity/ SPV are low	3. Complex tendering and contracting process and high potential for disputes
	4. Difficult to make changes (route, schedule, fleet size) during the contract period

***The gross-cost model***

Under this system the operator is paid a specified sum on an agreed price structure to provide the service for a given period. The authority reimburses the operator in full for the cost of providing the services. All revenue is collected and remitted to the authority. If the service is profitable, the authority will receive a surplus, otherwise it must fund the shortfall. The operator carries no revenue risk, though in this case they carry all of the operating costs risks. This route can be operated by multiple private operators, and they do not have any incentives to race recklessly against other private operators. This approach is suitable in cases where the fare revenues are likely to be uncertain, such as in new routes or low density corridors.

A gross-cost contract will be appropriate if:

- The authority wishes to avoid on-street competition for passengers,
- The authority wishes to provide free or discounted interchange between all routes in all areas in order to minimize route duplication, and
- A high percentage of revenue is collected off-vehicle.

The merits and demerits of the system are listed below in table 9-5.

**Table 9-5: Merits and Demerits of Gross Cost Model**

Merits	Demerits
1. Easy bid process and contract management	1. Risk of revenue leakage borne by a public entity
2. Flexibility in changing schedules, fares, services based on the needs	2. No incentive for higher ridership
3. Limited potential for disputes	3. Need an effective monitoring
4. Better integration between modes/services	4. Financial commitments of public authority can be high
5. All operational risks borne by the private operator	5. The higher cost of staffing, monitoring operation and revenues
	6. Demand risk borne by the authority /SPV
	7. The SPV will have to make their own arrangements for fare collection

### Recommendations

Of the above 4 options, the last option of setting up the SPV is most suitable as it would organise the existing / new IPT services under the umbrella organisation, without any heavy

**Bhopal City Link Ltd (BCLL), Special Purpose Vehicle (SPV) is majorly owned company of Bhopal Municipal Corporation, incorporated in 2006 to provide an organised and efficient dimension to public transportation for the city of Bhopal. This SPV other than running city buses also provides radio taxi services specially for the elderly and the female population of the city working till late hours. At present there are 100 taxis operating on 24x 7 basis. The basis features of these taxis are that they are provided with GPS for providing safety & security to passengers and electronic fare meter (starting at 2 kms for Rs 50 and increases by Rs 23 per km, night charges are 30% more).**

**Similar kind of SPV model "Atal Indore City Transport Services Ltd , Indore was set up to operate and manage the public transport system in Indore with private sector participation to overcome financial constraints. This SPV apart from running the city buses provides with autorickshaw services to provide the last mile connectivity to commuters. This system started in March 2014 and till date about 200 autorickshaw drivers have joined the SPV. The autorickshaws are provided with GPS and electronic meter system for the efficient working of the system and for providing safety to passengers.**



financial burden on the government.

Out of the two models of the PPP, net cost model is considered the most suitable model for operations of intermediate public transport in cities. In this case the operator, in addition to operating and maintaining, the IPT will also collect fare revenues and pay certain license fee to the SPV. Since the operations and demand risks are both borne by the operator, the drivers will be incentivised to provide good quality services as the revenue would belong to them. The burden on the SPV is also minimal as it requires only limited staffing to monitor operation. The SPV while selecting the operator can specify the technology, emission standards, performance standards and ITS facilities to be installed.

### Organisational Structure of SPV

The organisation structure for the SPV is given below Figure 9-1.

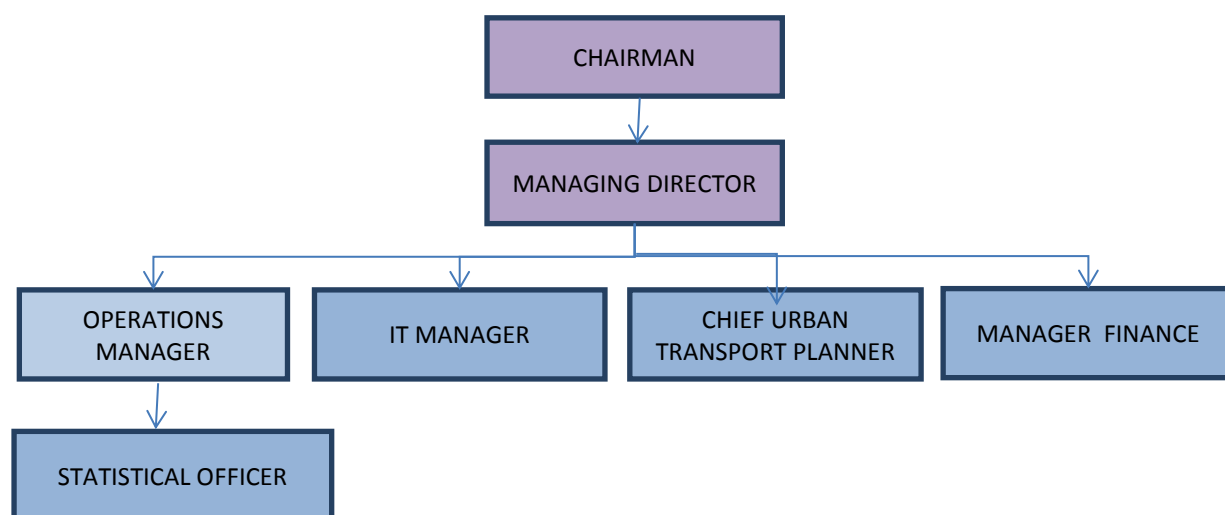


Figure 0-1: Structure of SPV

### Structure of SPV

The staffing requirement for SPV (Table 9-6) would be as follows:

Table 9-6 Staffing requirement of SPV

Designation	No	Qualification	Experience	Job description
Chief executive officer	1	To be taken on deputation from the state civil	15-18 yrs of experience in civil services	Executive Head, responsible for its overall management

Designation	No	Qualification	Experience	Job description
		department		
Urban transport planner	1	Masters degree in urban transport planning	8-10 years in any consulting or operational entity	Undertake all route/network design and operational planning functions
Manager Finance	1	MBA (Finance) /CA	8-10 years in the finance and accounting functions in any organisation	All financial planning and management
Manager, Operations	1	Graduate/ Masters in mechanical engineering	10 years' experience in operation of any fleet of at least 50 vehicles	Responsible for monitoring the contract terms and certifying claims of operators
IT manager	1	B.E/M.E(Computer Engineer)	6-8 years in managing IT systems in any organisation	Responsible for all the ITS systems, control systems and ITS equipment
Statistical officer	1	B. sc /M.Sc (statistics)	6-8 years of data collection and management	Responsible for coordinating all data collection, management as well as MIS
Support staff like secretary, clerical staff, record keeper etc	6			Secretary to the CEO, record keeping, administration, accounting etc
Watch and ward staffs	10	High school pass		To guard offices and other facilities of the SPV
Grade IV staffs	4	High school pass	2 office peons, one messenger, one driver	
Other staffs Representatives of auto/ bus unions	1	Bachelors degree in any subject		Looking after the welfare of the drivers

Some of the identified staff can be taken on deputation from the government, whereas others will have to be recruited from the open market as the required skills would not be available to any agency of the government. For example, the CEO, Manager, Finance and support staffs, etc. Apart from these, other members who can be a part of this SPV should be the RTO, an engineer from Municipal Corporation who is responsible for the provision of infrastructure and representatives from the traffic police. Further, some services can be such as watch and ward services can be outsourced.

### **Functions of SPV**

To strengthen the institutional framework and for better operation and management of IPT service, the SPV may be set up. The main objective of the SPV are the policy and planning functions, whereas operations will be outsourced to the private operator. This will enable senior management to devote time to policy and planning and monitoring instead of being caught in the day-to-day operational issues and at the same time, reduce the financial burden on the SPV.

Following are the functions of the SPV:

1. Obtain route permits to run services
2. Undertake periodic studies to assess the travel demand based on which the review of routes is undertaken
3. Based on the above studies, specify the schedules, performance standards etc.
4. Contract IPT operations with private operators, based on demand for such services
5. Monitor the performance to ensure that it is in line with the contracted terms
6. Maintain a control room and manage the overall ITS system, including PIS, a management information system and data collection
7. Specification, monitoring of quality of services and emission standards for vehicles
8. Fixing and revising of fares
9. Select and implement technologies
10. Educate the public about the system
11. Arrange training and education to drivers for improving driving behaviour.

## 10. RECOMMENDATIONS

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Some of the issues and observations that have come up with the study and analysis of field data for the 19 cities are mentioned below (Refer to Chapter 5 and 6):

1. Policy /regulatory framework for IPT
2. No economic stability for drivers
3. Lack of infrastructure facilities
4. Lack of social benefits for the drivers
5. Outdated technology to meet emission standards
6. Lack of usage of modern technology (ITS)
7. Lack of financial support
8. Lack of ownership/institutions for IPT vehicles

The recommendations that can be followed by cities to solve the challenges are given in the subsequent chapters.

### **Policy/regulatory framework for IPT**

In the previous chapter, the problem of a proper policy and regulatory framework for IPT (Refer to chapter 5) has been discussed in detail. To address the issue, the following steps can be taken:

#### **1. NUTP**

The role of IPT can be elaborated in the NUTP policy in the following way:

- In cities where there is no proper network of public transport like Bus, Metro, and Rail, the IPT should act as a feeder to the main modes.
- In case of cities where public transport is completely absent, the IPT should act as a main mode till a suitable PT option is developed for the city.
- In cities whether the PT system has a skeletal framework, the IPT should act as a complementary mode in only those areas of the cities where public transport supply is not available. In other areas, it must act as the feeder to main PT services.

## 2. Acts and Rules

There is a need for Review of Central and State Motor Vehicles Acts. The central act should include the following:

- Use of modern technologies,
- Methods of innovative financing of vehicles,
- The improvement of socio-economic driving conditions of commercial drivers,
- Roles and responsibilities of various institutions, leading to the enforcement of the rules and regulations, and
- Standard rules for all state motor vehicle rules relating to issue of permits, penalties, and time for processing, documents required etc.

The state act should include the following:

- Various kinds of fees must be paid during the issue of permits. The fees can be fixed according to the average annual earnings of drivers in the states. (Refer to Table 10-2)
- In case of issue of permits the state can put a cap on the numbers of IPT vehicles plying within the city. (Refer Table 10-1).
- Route rationalisation and fares revision to be included in the policy. (Refer to section on route rationalisation and fare fixation).

## 3. Permits

In order to bring consistency in issue of permits, the following steps should be taken:

- There is a need for a single MV Rule for all states as stated earlier in acts and rules section.
- A two-tier permit system can be adopted like walk up and dispatch services that is lacking in most of cities in India. This permit system will help provide the last mile connectivity to users.
- The transparency on the issue of permits can also be ensured making the vehicle registration process more elaborate for owners like including biometrics.
- The permit fees must vary according to the type of route. (Refer to Table 10-2)

- The number of permits to be issued by the city can be fixed as per the table 10-1 given below. This would ensure that the supply of IPT vehicles meets the demand while controlling the unhealthy competition and congestion on streets.

**Table 10-1: The number of permits to be issued under various scenarios**

S. No	Scenarios	As % of the seating capacity of the bus <sup>8</sup>	Tempo or Tata Magic (8 seater) / lakh population	Tata Autorickshaws (3 seater) / lakh population
<b>A. <u>Medium and small size cities</u></b>				
1.	Absence of Public transport	100 %	200 approx	500 approx
2.	Presence of a skeletal form of Public transport	25%-70% <sup>9</sup>	50-140 approx	125- 350 approx
3.	Presence of Public transport (acting as feeder services)	23% <sup>10</sup>	50 approx	120 approx
<b>B. <u>Megacities more than 4 million population</u></b>				
1.	Presence of Public transport (acting as feeder services)	23%	N.A <sup>11</sup>	140 approx

- For strong enforcement of permit-related issues by the traffic police, complaint centres for the drivers to submit complaints/suggestions/case of harassment against bribes should also be set up.

#### 4. Creation of an Institution for regularising operations in cities

There is a need for creation of a full time institution in all cities for the day-to-day operations of the IPT services. This institute would look into the planning, routing, fares fixation, fixation of standards, quality of services, benefits for drivers etc.

#### 5. Route Rationalisation

Following are the three options that can be used:

<sup>8</sup>Seating capacity of standard bus is assumed to be 40 passengers per bus.

<sup>9</sup> Assumption is depended on the kind of existing public transport in the city.

<sup>10</sup>23% of users use IPT as a feeder to main mode Source: Business plan for operations of feeder services DMRC (2009).

<sup>11</sup> It is assumed that only 3 seater autorickshaws in megacities.

A. To take care of the problem of route rationalisation, the following steps must be followed to develop routes of shared IPT:

- i. “Do nothing scenario” in which no modification is done to the existing routes
- ii. Modification of existing routes to delete maximum overlaps and competition
- iii. Introduction of new routes for services in areas of absence of IPT

This in turn helps in bringing efficiency and reliability in the system for commuters and reduces competition leading to better earning amongst drivers. Along with this, a strong level of enforcement by the traffic police also helps in proper implementation.

B. A second option for route rationalisation can be route-wise permit fee variation for the IPT services. To end the problem of lack of service coverage in a few areas of the city and also to incentivise the drivers with low financial status, the fees may vary according to the demand. The higher the ridership on a route, the more would be the permit fee and vice versa. If Rs 200 is taken as daily minimum and Rs 1,000 as the maximum income for the auto drivers as per feedback received from the survey the ratio of the earnings are 1:5 (Table 10-2). Permit fee can thus be fixed as follows<sup>12</sup>:

**Table 10-2: Estimated Route Permit Fees**

	Minimum (Rs) (Less profitable routes)	Average (Rs)	Maximum (Rs) (Profitable routes)
Earning /day by drivers (30 working days)	200	600	1,000
Earning /month by drivers	6,000	15,000	24,000
Earning / year by drivers	72,000	2,16,000	3,60,000
Earning over 5 years by drivers	3,60,000	10,80,000	18,00,000
<b>Ratio of permit fees</b>	<b>1</b>	<b>2.5</b>	<b>5</b>
Price of the 5 years permit	200	500	1000 <sup>13</sup>

<sup>12</sup> Table above is just for calculating the ratio; however it has to be adjusted according to the city’s existing fees structure.

<sup>13</sup>For implementation if the amount is considered to be too less, then a factor of maybe 20% can be added to the fees

- C. A third option that can be adopted is clubbing the profitable routes with the non profitable routes and developing a cluster system in which operations for certain routes are tendered to private operators, so that every operator in its own cluster has both the routes to equalize the variation in earning. However, all these methods are possible only if an SPV is to regularise IPT operations.

## 6. Strong enforcement

Lack of enforcement can be controlled by using ETMs for registering penalties.

### Economic stability of drivers

IPT sector is said to be unorganised therefore, its services are provided by individual drivers (who may be owner drivers or rented drivers). The survey of 19 cities indicated that most of the IPT drivers are financially weak and some of them are seasonal workers, as a result, most of them hire IPT vehicles for rent from the owners (varying from city to city). This results in greater refusals, overcharging by drivers and poor quality of services to commuters. In addition to the rent, the drivers have to pay vehicle maintenance cost, bribes to traffic police, fuel cost, etc. All these factors together lead to economically unstable conditions of IPT drivers.

However, this can be solved by the following methods:

1. The rent should be fixed from the RTO, so that owners cannot charge the drivers unnecessarily. The rent fixed could correspond to a percentage of the expected daily income (20%). The drivers would then be less inclined to drive rashly and to overcharge the commuters. Also lower rent would help in greater savings and a better livelihood for the drivers.
2. In order to bring economic stability, 4 different models can be developed. They are:
  - The government owning the system in which the government rents out the vehicles to drivers;
  - A private operator takes charge of the services provided on a net cost or a gross cost model implemented by an SPV;



- A corporate company like Radio Taxi- Meru and Easy Cabs owns the vehicles and hires drivers to run them under certain rent and conditions; or
- An NGO/ private companies like in case of G-Auto, Three Wheelers United Pvt Ltd takes up the ownership of providing services and supporting drivers of IPT vehicles.

The merits and demerits are discussed in great details of the options in the Alternative scenarios developed for finance and Institutional sections later.

3. As far as the high maintenance cost is concerned, it can be lowered by providing the drivers a shared repair workshop along with a proper training to do the basic repairs, so that every time for minor repair work the drivers do not have to go the private workshops.
4. To increase the revenue for the drivers further, other options like advertisements, renting to rallies, schools, tourism etc can be explored in various cities.

### **Infrastructure facilities**

IPT vehicles are not formally recognized by the government and therefore often lacks with the basic infrastructures facilities and work environment for the drivers. Following are the suggestions for improvement:

1. Proper and sufficient stands facilities should be provided at the main terminals like railway stations, airports or places of interchanges with other modes of Public Transport like Metro, BRT, etc. This will help reduce congestion on roads as the drivers do not have to stop illegal and it will also help to deal with the Traffic Police. A good example of such implementation can be found in Lucknow where terminals with lanes for passengers and vehicles have been created. This provides both benefits to drivers as well as passengers. The stands also have access to toilets and drinking water facilities as this share a common area with the other interchange points.
2. Stands for IPT should be created depending on the demand of passengers and land use locations surrounding it. For example, if the area is commercial or residential

then stands must be provided as the demand is on the higher side compared to other areas.

3. To stop the congestion on roads due to drivers queuing up on the roadside while picking up or dropping off passengers, small “halt and go” stands for these vehicles can be created to allow smooth flow of traffic. The process has been implemented in many places in Delhi and its success should encourage replication in other areas also.
4. Parking areas should be created for the drivers to safely park their vehicle at night on a payment of minimum charges. This area can be allocated by the government or a private party. To lower the cost of maintenance, common repairs and maintenance facilities could also be provided in the same place. Drivers could have access to shared repair equipment, after getting a quick training on how to use it (This training may be organised by unions or NGOs).
5. The creation of new auto stands should come with various amenities like rest shelters where they can have access to drinking water and toilets. It is not much to provide, and it can significantly improve the working conditions of the drivers, and thus the quality of the service. The already existing stands can have kiosks (in the form of small tea stalls) and the same kiosks can act as shelter for rest and providing refreshments to drivers. This in turn will help to improve the driving conditions for drivers.
6. The availability of more gas stations seems essential, as the drivers do not have to any further queue at stations to refill gas into the vehicles leading to saving of time and also will help them increase their daily income.
7. It is often observed that IPT vehicles are parked near the intersections. There should be strict enforcement for regulating the halting of these vehicles near intersections. A minimum distance of 250 meters from the intersections/ junctions should be observed for restricting the halting of IPT.

### **Social benefits for the drivers**

It is found from the study that the social status and living conditions of the IPT vehicle drivers are precarious and this has an impact on the behaviour and driving practices. Help is

not provided by the government in terms of training, insurance, medical facilities, pension, and education as this sector is unorganised. Also long working hours and lack of a proper trade unions looking after the welfare of the drivers are some of the major issues faced by the drivers as mentioned in chapter 5 of the report.

To solve some of these problems the following recommendations are made:

1. To address the long working hours, the 50/50 scheme implemented in the Philippines (Puerto Princesa) and Indonesia (Bogor where the drivers are divided into two groups and allowed to work on alternative days to fetch more passengers, reduce congestion on roads, and spend less time in the polluted traffic. This scheme has been implemented in small-sized cities, but it can also be implemented in bigger cities by creating different zones instead of creating two groups.
2. For the provision of social benefits to drivers the government/ SPV / private bodies/NGOS/ unions of IPT vehicles must spread awareness to the drivers in order to avail the following facilities provided by the Government schemes like:
  - **Accident Insurance:** To extend social security cover, government/ SPV / private bodies/ unions of IPT vehicles can ensure drivers under the Janta Personal Accident Insurance Policy with an annual premium of Rs 15/- wherein the family of the drivers will get Rs 25,000/- on the death of the drivers and the maximum sum that can be insured is Rs 1,00,000 per person. This Janta Personal Accident Insurance is being promoted by the New India Insurance Company.
  - **Medical checkups:** Free medical check-up/consultation facilities at various government and private hospitals can be extended to the drivers and their families.
  - **Pension scheme:** An initiative, “Swavalamban Scheme” by the Pension Fund Regulatory and Development Authority, India encouraged people from unorganised sector to join the New Pension System (NPS) launched in 2010-11. Under this scheme, the government will contribute Rs 1,000 per year to each NPS account opened with a minimum contribution of Rs 1,000 and a maximum contribution of Rs 12,000 in 2010-11. The scheme aimed at encouraging the people from unorganised sector to voluntarily save for their retirement by

enrolling themselves under the New Pension System (NPS). The government or the unions should take responsibility and also bring awareness to the drivers. The scheme can be extended by the government and the drivers may be advised to become a part of it.

- **Free family Education:** At present, under “SarvaSikshaAbhiyan”, the education is free for any school children. Adult education will also be promoted for the drivers through / Government/NGOs/ private bodies/ SPV for example.
- 3. **Auto-unions:** A single autorickshaw management centre (or union) could be set up in all cities with defined functions and structure to look after the welfare of the autorickshaw drivers.

### Modern Technology to meet emission standards

Some of the measures that can solve the problems of outdated technology to meet emission standards are as follows:

#### 1. Financial Incentives

In order to solve the problem of old vehicles plying, retrofitting can be done using the latest technologies like catalytic converters or CNG / LPG kits. But this retrofitting has high costs of replacement and difficulty in availability of cheap finances. Thus, the government needs to provide financial incentives such as sales tax exemption and interest subsidy on loans along with strict mandates from the Supreme/ High courts to ensure up gradation of vehicles. Few cities such as Delhi, Bangalore, Chennai and Hyderabad have already taken the lead in this. Bangalore has made CNG/ LPG mandatory in 3-wheelers and introduced a Green Tax (imposed on older vehicles at the time of the annual renewal of their permit) and a fiscal incentive for LPG conversion (City government has offered a subsidy of around Rs 2,000 to the three-wheeler owners to help bear the cost of conversion). Similarly, Kolkata and Chandigarh have initiated firm efforts.

#### 2. Use of modern technologies

In case of improvement of engine technologies of IPT vehicles, the most important solution found today is an air assisted fuel injection method for 2 stroke engines to

reduce emissions, to maintain proposed levels of BS IV & V as well to improve fuel efficiency by 20-30%. Also Gasoline Direct injection for two-stroke engines are a good option as the fuel efficiency increases by 20% of vehicles, though it's a bit expensive. This technology helps in reduction of NOx emissions without three way catalyst. These technologies are already manufactured by Bajaj and more of vehicle manufacturers should be initiated to use the technology. In case of 4 stroke port fuel injection in combination with suitable after treatment systems may be the most cost effective. Also Digital twin spark ignition system (DTSi) technology that is a patent of Bajaj in all 4 stroke engines lead to reduction in emissions and improved fuel performance by 40% and 12%. However, this is only being used in 2-wheeler vehicles. This technology can be used by three wheelers also.

### **3. Upgradation to 4 stroke and BS IV**

With the financial incentives from the government, the drivers and manufacturers must be encouraged to upgrade their IPT vehicles to 4 stroke and to BS IV standards, since the new BS IV standards are to be launched in the year 2015.

### **4. Regulatory measures**

- The engine and fuel-related reforms and regular checkups of all vehicles can be ensured only by appointing a single nodal agency specifying the standards and norms, keeping in mind the latest technologies.
- Adoption of separate emission standards for HC and NOx emissions should be adopted, instead of the current combined (HC + NOx) standards and also CO2 standards should be defined. These reforms should be pursued by the Standing Committee on Implementation of Emissions legislation set up by MORTH for emission legislation.
- State governments should restrict the use of IPT vehicles to not more than 8 years, so that it runs in good condition.

### **5. Other measures**

- Good roads and better traffic management to reduce pollution
- Setting up of more CNG/LPG stations

- More research into alternative fuel and vehicle technology standards for IPT in order to remove monopoly in the market so that there is increased availability of superior technologies at lower cost to meet the future needs of emissions and standards.

### **Usage of modern technology like ITS**

The following are some of the measures that can be taken to install ITS facilities :

1. ITS components in case of IPT vehicles can be categorized into three i.e, in a vehicle, in the control room and with the traffic police components. For more efficiency, these components can be implemented in two phases. Phase 1 consists of the implementation of Panic Button, GPS along with a Traffic Management Centre, “hired/vacant” panel (status panel), and E-challan and phase 2 consists of implementation of PIS, Security Camera and smart-card reader.
2. Providing subsidy to the owners of these vehicles to partially meet the cost of GPS/GPRS. It could be similar to the case of Delhi NCR where it has already been made mandatory for the drivers to have a GPS in order to get their fitness certificate.
3. The control centre can be set up on a PPP basis where the private party can recover its cost on a monthly basis through the extra transaction cost incurred by passengers for payment of fares. Also the control room for the public transport can also be integrated with the IPT vehicles. In case a city does not have a control room, a new one can be set up.

### **Financing of IPT Vehicles**

Out of the seven models for financing as discussed in chapter 8, the last model of formation of SPV seems to be more feasible as mainly in the other cases the fund provision is limited and there are chances of profit motives setting in or sudden shutting down of the NGOs/private bodies due to lack of fund. So benefits cannot be provided on a regular basis. Also in a few of the options the process is lengthy and tedious and requires the drivers to be financially sound in order to repay the loans. In option 7, formation of a new SPV/functioning of an already existing SPV in the city, the drivers can form a consortium and the finance will be easily available, as they will be known by the SPV/ government. Besides

these, there would not be any risk of a sudden shortage of funds or close down of companies, therefore the system would continue to work regularly.

### **Institution for IPT**

Of the 4 options discussed in chapter 9, the last option of organising the IPT under the umbrella of an existing SPV or setting up a new SPV (in case an existing SPV is not available) is most suitable as it would organise the existing/ new IPT services under the umbrella organisation, without any heavy financial burden on the government.

The net cost model for setting up SPV is considered the most suitable model for operations of intermediate public transport in cities. In this case the operator, in addition to operating and maintaining the IPT will also collect fare revenues and pay certain license fee to the SPV. Since the operations and demand risks are both borne by the operator, the drivers would be incentivised to provide good quality services as the revenue would belong to them. The burden on the SPV is also reduced as it requires minimal staff to monitor operations. The SPV while selecting the operator can specify the technology, emission standards, performance standards and ITS facilities to be installed.

### **Fare Fixation**

Total the average savings of an IPT driver are less than Rs 5,000 per month, i.e. about Rs 170 per day. This does not provide him with enough resources to provide education for his children or ensure good health of his family. The Minimum Wages Act, 1948 has stipulated fixation and enforcement of minimum wages in the Country. As per the act the average monthly wages of a semi skilled labour works out to be approximately Rs 9,000. The existing earnings of an IPT driver are much below this level.

If the minimum wages are considered as the saving after excluding the expenses incurred by a driver, the total monthly earnings of the driver should be as follows (Table 10-3):

**Table 10-3: Expected Fare per Kilometer**

S.No.	Heads	Autos (General Service) (Rs)	Tempos/ Vikrams/ Tata Magic (Shared Service) (Rs)
1	Total Earnings	24,000	35,300
2	Cost per kilometer	5.8	1.7
3	Saving per kilometer	3.5	0.6
<b>4</b>	<b>Fare per kilometer</b>	<b>9.2</b>	<b>2.3</b>

The following assumptions have been taken:

- Average number of working days in a month = 26
- Fuel cost per day for Autos is Rs 250 and for Tempos it is 300 (from primary survey)
- Average 100 kilometres operated per day as per figure 4-15
- Average rent per day for autos is Rs 250 and for tempos it is Rs 650 (Refer to figure 4-14)
- Average Maintenance and cost as per Table 4-3 is Rs 1,700 for autos i.e. 5% of the total earnings and Rs 1,300 for tempos i.e. 3% of the total earnings
- Average miscellaneous expenses as per Table 4-3 are Rs 300 i.e. approximately 1% of the total earnings

In case financing is available for the IPT drivers under the SPV, the expected fare per kilometer would be as follows (Table 10-4)

**Table 10-4: Expected Fare per Kilometer<sup>14</sup>**

S.No.	Heads	Autos (General Service) (Rs)	Tempos/ Vikrams/ Tata Magic (Shared Service) (Rs)
1	Total Earnings	20,000	24,000
2	Cost per kilometer	4.2	0.9
3	Saving per kilometer	3.5	0.6
<b>4</b>	<b>Fare per kilometer</b>	<b>7.7</b>	<b>1.5</b>

The following assumptions have been taken:

- The capital cost of an auto is Rs 1.3 lakh and of tempo/ Tata Magic is Rs 3 lakh
- The repayment period for the loan is taken as 7 years

<sup>14</sup>The calculations are based on 2013 – 2014 prices.



- The daily expenditure towards payment of EMI is Rs 95 for autos and Rs 215 in case of Tata Magic
- The Average vehicle occupancy is 6 passengers

The existing fare across most of the cities, except in metropolitan areas, is less than the expected fare given in Table 10-3 & 10-4. It therefore calls for the revision of fare in most of the cities. Also, this fare would need to be reviewed periodically – say quarterly or biannually – to reflect the changes in fuel price or wage rate.

### ***Proposed Formula for Fare Fixation***

Based on the above calculations, the proposed fare fixation formula for autos is as follows:

$$\text{Fare per km} = 2 * [(0.07\% * CV) + \left(KM * \frac{FC}{FE}\right) + (0.26 * W)]$$

The proposed fare fixation formula for tempos/ Tata Magic is as follows:

$$\text{Fare per km} = 1.6/P * [(0.07\% * CV) + \left(KM * \frac{FC}{FE}\right) + (0.21 * W)]$$

Where:

CV = Capital cost of the vehicle

KM = Average Kilometres operated per day

FC = Cost of Fuel

FE = Fuel Efficiency the vehicle

P = The average occupancy the vehicle

W = minimum daily wages as per Minimum Wages Act, 1948

## 11. CONCLUSION & WAY FORWARD

Intermediate public transport (IPT) is extensively used in Indian cities not only in small and medium sized cities but even large cities and play an important role in providing mobility at a low cost to a large section of the society. Some of the major issues and challenges faced by this sector as per actual survey of 19 cities across India are given below:

- Inadequate policy /regulatory framework for IPT
- No economic stability and social benefits for drivers
- Lack of infrastructure facilities
- Outdated technology to meet emission standards
- Lack of usage of modern technology (ITS) for operation control
- Lack of financial support
- Lack of institutional ownership of the IPT sector

IPT will continue to play an important role in public transport in Indian cities in the foreseeable future. Hence all the above listed issues should be given due attention.

### Way forward

The following are the considered way forward for the study:

1. Issue of advisories from the MoUD for establishment of the new SPV for IPT (in case not available for city bus services) in cities or functioning of existing SPV (bus services) to integrate services with IPT
2. Stakeholders' meeting for cities and experts for their suggestions and feedback
3. Workshops to disseminate the recommendations provided in the report for creating awareness among city officials and general public
4. Issue of mandate from MoUD for cities to use these recommendations as standard guidelines for IPT vehicles in all cities

## 12. REFERENCES

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### Reports

- 1 : KSRTC. Award for best practice projects in urban transport. 2012
2. Intelligent Transport System for City Bus, Jaipur. Institute of Urban Transport Report. August 2013
3. Improving Informal Transport, case studies from Asia, Africa, and Latin America. Teri and Un-habitat and Genus Report. January 2013.  
<http://mirror.unhabitat.org/list.asp?typeid=3&catid=631>
- 4: Rijurekha Sen and Bhaskaran Raman. Intelligent Transport System for Indian Cities. *Indian Institute of Technology, Bombay*.  
<https://www.usenix.org/system/files/conference/nsdr12/nsdr12-final2.pdf>
5. Documentation of Best Practices. The Auto Rickshaw restructuring project. One World Foundation India. January 2011.  
[http://indiagovernance.gov.in/files/autorickshaw\\_restructuring-best%20practice.pdf](http://indiagovernance.gov.in/files/autorickshaw_restructuring-best%20practice.pdf)
- 6: Deepak Baidur. Transport Scenario in Indian cities. *Indian Institute for Human settlements*, Bangalore. <http://cistup.iisc.ernet.in/pdf/5thFdayEvent/16ffd2014.pdf>
- 7: Anvita Arora, Mats Jarnhammar and Faizan Javed. Green and Pro-poor? The role of Informal Public Transport in India. *Cities Development Initiatives for Asia*. December 2010.  
<http://www.cdia.asia/wp-content/uploads/Green-and-Pro-poor.pdf>
8. A study of the Auto-rickshaw sector in Bangalore city – Suggestions for Improved Governance. CISTUP Report. *Indian Institute of Science, Bangalore*. December 2012.  
[http://cistup.iisc.ernet.in/pdf/newsandevents/Autorickshaws-Blore\\_FinalReport\\_Dec12\\_Cistup.pdf](http://cistup.iisc.ernet.in/pdf/newsandevents/Autorickshaws-Blore_FinalReport_Dec12_Cistup.pdf)
9. Narayan V.Iyer. A technical assessment of emissions and fuel consumption reduction potential for two and three wheelers in India. August 2012.  
[http://www.environmentportal.in/files/file/Iyer\\_two-three-wheelers\\_India.pdf](http://www.environmentportal.in/files/file/Iyer_two-three-wheelers_India.pdf)
10. Innovative Transport Solution (iTrans). Two and Three-wheelers in India. *IIT Delhi*. June 2009.  
[http://www.theicct.org/sites/default/files/publications/2\\_and\\_3\\_wheelers\\_in\\_India.pdf](http://www.theicct.org/sites/default/files/publications/2_and_3_wheelers_in_India.pdf)
11. Akshay Mani, Madhav Pai, Rishi Aggarwal. Sustainable Urban Transport in India. Role of the auto-rickshaw sector. *World Research Institute and Embarq*.  
[http://pdf.wri.org/sustainable\\_urban\\_transport\\_india.pdf](http://pdf.wri.org/sustainable_urban_transport_india.pdf)

12. Pro-poor mobility, Policy guidelines and case studies. Teri, Genus and Un-Habitat.2013.  
[http://www.teriin.org/div/pro-poor-mobility\\_policy-guidelines-case-studies.pdf](http://www.teriin.org/div/pro-poor-mobility_policy-guidelines-case-studies.pdf)
13. Taral Shukla. Organizing the role of the intermediate public transport sector: Focus on Auto rickshaw services. *Dissertation Draft Report, CEPT University*. 2012.
14. State of the Art review report. Traffic Management and Information Control Centre and National Telephone Helpline Operational Manuals. DIMTS. May 2013.
15. Akshay Mani and Pallavi Pant. Review of Literature in India's Urban Auto-rickshaw sector. A Synthesis of findings. *Embarq India*.  
<http://www.embarq.org/sites/default/files/Review-Literature-Indian-Urban-Auto-Rickshaw-Sector-EMBARQ-India.pdf>
16. Akshay Mani. Tamil Nadu Intermediate Public Transport (IPT) Policy. *Embarq India*. May, 2013.  
<http://www.indiaenvironmentportal.org.in/files/file/Tamil%20Nadu IPT%20Policy May%202013.pdf>
17. Development of Toolkit under Sustainable Urban Transport Project. ITS toolkit for Traffic management. MoUD.2013
18. Planning and Implementation of Modern City Bus Service on PPP - Key Learnings. IUT and UMTCL Report. July 2011.
19. Fouracre and Maunder. A review of International Public Transport in Third World Cities. *PTRC Summer Annual Meeting, University of Warwick, 9-12 July, 1979. Transport Research Laboratory. Department for International Development*. [http://www.transport-links.org/transport\\_links/filearea/publications/1\\_685\\_PA1091\\_1979.pdf](http://www.transport-links.org/transport_links/filearea/publications/1_685_PA1091_1979.pdf)
20. Francisco Posada, Fanta Kamakate and Anup Bandivadekar. Sustainable Management of Two- and Three-wheelers in Asia. . The International Council on Clean Transportation, Working paper 2011-2013.December2011.[http://www.theicct.org/sites/default/files/publications/ICCT\\_Asia23wheelers\\_2011\\_1.pdf](http://www.theicct.org/sites/default/files/publications/ICCT_Asia23wheelers_2011_1.pdf)
21. A study on para-transit system in Indore city. TARU and EMBARQ Report. January 2011.

### **Presentations / Workshops**

1. Transforming Cycle rickshaw – Fazilka Ecocabs. World's First Dial-a-rickshaw Service. *Presentation by Navdeep Asija*. 4<sup>th</sup> December 2011.

- 2: Fazilka Ecocabs. Case Study. By Navdeep Asija, Secretary of Graduates Welfare Association Fazilka (GWAFF). 2010.
- 2: Connect Karo / G-Auto – Nirmal Foundation. *Presentation by Embarq India*. 15<sup>th</sup> and 16<sup>th</sup> April 2013, Mumbai, India.
- 3: Workshop on ITS toolkit for TMS. *By IUT Delhi*. 30<sup>th</sup> May 2014.
- 5: Mobile Phone Centric Low Cost High Value application for On-Demand Response Scheduling System for Auto-rickshaws as a Key IPT Mode for Indian Cities. *Presentation by Anupam Vibhuti*. December 2010. *Urban Transport Planning and Management – Emerging Challenges*. <http://www.urbanmobilityindia.in/upload/conference/8910c92f-5328-4572-a107-a84c89feef85.pdf>

### Journals

1. Sanjay Vaidya, Sourabh Gupta and Gouresh Singhal. GPS devices to increase efficiency of Indian Auto-rickshaw segment. *World Academy of Science, Engineering and Technology, International Journal of Social, Human Science and Engineering*. Vol.8, No.3, 2014. <http://waset.org/publications/9997647/gps-devices-to-increase-efficiency-of-indian-auto-rickshaw-segment>

### Acts and Laws

1. Government of India. Planning Commission, Recommendations of Working Group on Urban Transport for 12<sup>th</sup> Five Year Plan, 2011. [http://planningcommission.gov.in/aboutus/committee/wrkgrp12/hud/wg\\_%20urban%20Transport.pdf](http://planningcommission.gov.in/aboutus/committee/wrkgrp12/hud/wg_%20urban%20Transport.pdf)
- 2 . Government of India. The Central Motor Vehicle Rules, 1989. <http://www.tn.gov.in/sta/Cmvr1989.pdf>
3. Government of NCT of Delhi. Transport Department. Delhi Motor Vehicles Rules, 1993 (As amended). <http://transport.delhigovt.nic.in/pdf/DMVR.pdf>
- 4: Rajya Sabha. The Motor Vehicle (Amendment) Bill, 2007.
- 5: Government of Karnataka. The Karnataka Motor Vehicle Rules, 1989. <http://rto.kar.nic.in/Revised%20M.V.%20VEHICLES%20RULES%20Corrected.pdf>

## **Annexure 1: Comparative Table for Case Studies**

## Comparative Table for Case Studies

Parameters	Turkey	Dakar- Senegal	Dar-es-salaam - Tanzania	South Africa	Indonesia	Ahmedabad
<b>Population</b>	74 million	2,5 million	4,4 million	51 million	247 million	5,6 million
<b>Type of IPT</b>	Dolmus (mini-bus)	<ul style="list-style-type: none"> <li>Fast buses (mini-buses)</li> <li>Ndiaga-Ndiaye (vans)</li> </ul>	Daladadas (minibus - shared taxis)	Kombi (mini-bus-taxi service)	Angkot (mini-vans), Becak (pedi-cabs), Ojeks (motorcycles)	G-Auto (auto-rickshaw)
<b>Characteristics</b>	<ul style="list-style-type: none"> <li>Routes &amp; fares fixed by the Departmental Traffic Commission</li> <li>Fixed stops</li> <li>14 passengers carrying capacity</li> <li>Drivers rent mini bus from a company working with the Municipality (the Transport Coordination Centre) and the Departmental Traffic Commission</li> </ul>	<ul style="list-style-type: none"> <li>Managed by different private owners</li> <li>Routes fixed by the Dakar Government</li> <li>Fares fixed by the Ministry of Commerce</li> <li>Non expensive services</li> <li>Meets 80% of the public transport demand</li> </ul>	<ul style="list-style-type: none"> <li>Routes fixed by SUMATRA</li> <li>No fixed stops</li> <li>Licences delivered by SUMATRA</li> <li>Coloured stripes to identify origin and destination of the vehicle</li> <li>Submit legal contracts between owners and the drivers to SUMATRA (Surface and Marine Transport Regulatory Authority)</li> <li>98% of the users have no car so are captive users</li> </ul>	<ul style="list-style-type: none"> <li>Door-to-door service</li> <li>Fixed pick-up points</li> <li>Fixed routes and fares</li> <li>16 seaters</li> </ul>	<ul style="list-style-type: none"> <li>Informal transportation</li> <li>Highly preferred by urban poor, students, middle income group</li> <li>Provides close connectivity</li> <li>Available at late nights</li> <li>Sponsorship from hotels and other businesses</li> </ul>	<ul style="list-style-type: none"> <li>First and largest organized fleet auto service in India</li> <li>Reliable Dial-a-rickshaw system (provision to book a rickshaw for Rs 15, 24/7) set up by a private foundation</li> <li>Membership fee of Rs 120</li> <li>Training, insurance cover and medical cover provided to the drivers</li> <li>Fares fixed by meter</li> <li>Facilities like fm radio, newspaper, city tourist map</li> <li>Services like airport express and Heritage express</li> <li>Use of ITS</li> </ul>
<b>Issues</b>	<ul style="list-style-type: none"> <li>Overcrowding</li> <li>Lack of security</li> <li>No complementarity with buses</li> <li>Lack of service in few areas</li> </ul>	<ul style="list-style-type: none"> <li>In poor condition (old, slow, breakdowns)</li> <li>No training for the drivers</li> <li>No respect of the routes</li> <li>No maintenance</li> </ul>	<ul style="list-style-type: none"> <li>Overcrowded</li> <li>Safety problems due to bad driving habits and hard working conditions</li> <li>Create congestion</li> <li>Not comfortable</li> </ul>	<ul style="list-style-type: none"> <li>Much more funds allocated to the bus and train sectors</li> <li>Financial problems</li> <li>Law enforcement</li> <li>Unsafe vehicles</li> <li>Fragmentation of owner's association</li> </ul>	<ul style="list-style-type: none"> <li>No pre-determined stops, creating congestion on roads.</li> <li>No formally designated intermodal points</li> </ul>	<p>Before implementation of G-auto:</p> <ul style="list-style-type: none"> <li>Refusals by rickshaw drivers</li> <li>Non accessibility (necessity to go to the main road)</li> </ul>

		of the vehicles	<ul style="list-style-type: none"> <li>• Very less owners follow the rule and apply for licences</li> <li>• No service in the suburbs</li> </ul>	<ul style="list-style-type: none"> <li>• Poor conditions of working</li> <li>• Poor infrastructure</li> </ul>	(to assure connection between formal and informal transport)	<ul style="list-style-type: none"> <li>• Over-charging</li> <li>• Unsafe</li> </ul>
<b>Solutions/ Suggestions</b>	<ul style="list-style-type: none"> <li>• Regulation (common tariff for Dolmus and Buses)</li> <li>• Training for the drivers and providing social benefits to drivers</li> <li>• More information to the commuters</li> <li>• Changing routes of the Dolmus</li> </ul>	<ul style="list-style-type: none"> <li>• Renewal of the fleet by the government (505 new vehicles)</li> <li>• Introduction of a formal system of route allocation</li> <li>• Official fare structure</li> <li>• Technical assistance and training for the operators and drivers</li> <li>• Maintenance of the fleet</li> </ul>	<ul style="list-style-type: none"> <li>• Integration of the Daladals with the DART (BRTS)</li> <li>• Relocation of Daladals to the peri-urban routes to avoid competition with BRTS.</li> <li>• Provide social benefits and training to the drivers</li> <li>• More enforcement to oblige the owners to get a licence</li> </ul>	<ul style="list-style-type: none"> <li>• Taxi recapitalization (new, safer and larger vehicles, equipped with ITS)</li> <li>• Registration of mini-bus operators (with independent Provincial Registrar)</li> <li>• Training and empowerment of the drivers</li> <li>• Social Benefits (pension, minimum wage)</li> <li>• Include them in the legislation</li> </ul>	<ul style="list-style-type: none"> <li>• Intermodal connections between buses, IPT</li> <li>• Lanes, parking and signage provided to Becak to create less confusion, reduce chaos.</li> <li>• Ranks provided at important locations (stations, intermodal changes)</li> <li>• Proper uniforms in order for the users to easily identify the drivers.</li> <li>• "Shift system" (drivers operate only 4 days a week) to reduce vehicles on road.</li> </ul>	<p>Use of ITS components like-</p> <ul style="list-style-type: none"> <li>• Passenger information systems</li> <li>• electronic fare meters and</li> <li>• GPS based automatic vehicle locator</li> </ul>



## **Annexure 2: Questionnaire/ Survey Formats**

## IPT Policy Questionnaire

### Government Policies

**Q 1. What are the various modes of IPT?**

- a. Shared Auto
- b. Private Auto
- c. Battery Operated Rickshaw

Q2. Number of registered IPT vehicles in the city?

**Q 3. What are the requirements for getting permit?**

S. No.	Description	Remarks
1.	Issuing Department	a. RTO b. Others (Specify)
2.	Fees	a. 100 – 300 b. 300 – 500 c. Above 500
3.	Documents required	a. Driving Licence b. Residence Proof c. Filled PCOP form/ Other forms d. Age Proof certificate e. Insurance certificate f. others
4.	Time Required for process	a. 1 – 15 days b. 15 – 30 days c. Above 30 days
5.	Is there any penalty imposed if delay by the government. If yes, what?	a. Yes b. No
6.	Duration of Permit renewal	a. less than 3 yrs b. 3 – 5 years c. More than 5 years
7.	Renewal fees for Permit	a. 100 – 300 b. 300 – 500 c. Above 500

Q43. What are the Laws/ Regulation/ ACTS governing IPT vehicles and in which year was the last Amendment done?

Q5. What are the funding provisions to operators?

- a. Loans from Banks/ NGO's
- b. Grant from government
- c. Others

Q6. What is the type of loan considered for buying the vehicle?

- a. Joint Liability Group

- b. DRI
- c. Others

Q7. What are the Route patterns?

- a. Fixed
- b. Variable

Q8. Which is the route fixing Agency/ Authority?

Q9. Are there any define routes in the city?

- a. Yes (Provide Map)
- b. No

Q10. How many defined routes are there in the city?

- a. 1 – 10
- b. 10 – 20
- c. 20 - 30
- d. 30 and above

Q11. How many vehicles (IPT) are allocated per route?

- a. 1-50
- b. 50- 100
- c. 100-150
- d. 150 and above

Q12. Are there any defined stops for IPT? If yes what is the distance between stops?

- a. Yes
- b. No

Q13. Is there any defined fare structure (metered/ non- metered)?

- a. Yes (Provide Details)
- b. No

Q14. How often is the fare revision done?

- a. Less than 1 year
- b. 1- 2 year
- c. 2 year and above

When was the last fare revision done?

Q15. What is the designated infrastructure provided?

- a. Designated parking area
- b. Workshops
- c. Training schools
- d. Rest rooms/areas for drivers
- e. Others

Q16. What is the engine type used for the IPT vehicles?( Percentage of each type)

- a. 2 stoke(petrol/CNG/LPG/Diesel)
- b. 4 stoke(petrol/CNG/LPG/Diesel)
- c. Others(petrol/CNG/LPG/Diesel)

Q17. What are the pollution control measures adopted?

- a. Fuel type used (Diesel/ CNG/ Battery operated)
- b. Vehicle fitness certificate
- c. Pollution certificate

**1.**

Q18. What are the technologies provided for security of people?

- a. GPS (vehicle tracking)
- b. Panic Button
- c. Helpline/ Call centre
- d. Others

Q19. What are the plans for improving the service in:

- a. Finance
- b. Technology in vehicle
- c. Others

Q20. What are the means of collecting revenue (apart form passenger revenue)?

- a. Advertisement
- b. Renting on – special events like rallies etc
- c. Renting through Schools/ organisations
- d. Others

How much is collected/ month?

Q21. What are the social benefits provided to the auto drivers?

- a. Home
- b. Medical facilities
- c. Discount on daily need items
- d. others

Q22. Is there any bank account or savings policy for drivers? If yes, what?

- a. Yes
- b. No

**IPT Policy Questionnaire  
Operators/ Driver**

Q1. Are there any Auto unions?

- a. Yes
- b. No

Q2. Is it registered under Trade Union Act/unregistered?

- a. Yes
- b. No

Q3. Average length travelled by Auto/ day?

- a. 50 – 100
- b. 100 – 150
- c. 150 – 200
- d. 200 and above

Q4. On an Average how many passengers travel/ auto/day ?

- a. 0 – 40
- b. 40 – 80
- c. 80 – 120
- d. 120 and above

Q5. What are the operating hours/driver/ day ?

- a. 0 – 8
- b. 8-12
- c. 12 and above

Q6. What is the seating capacity of the auto?

- a. 3-5
- b. 5-10
- C. more than 10

Q7. What is the passenger/trip for auto?

- a. Less than 4
- b. 4-8
- c. Greater than 8

Q8. How much revenue is collected per day?

- a. 200-400
- b. 400-600
- c. 600-800
- d. 800 and above

Q9. What is the fuel efficiency achieved per vehicle?(2 stroke & 4 –stroke petrol/CNG/LPG/Diesel)

- a. 20 – 25 kms
- b. 25 – 30 kms
- c. 30 – 35 kms
- d. 35 kms and above

Q10. Is the auto owned or rented?

Q11. How many autos does each operator own?

- a. 1 - 5
- b. 5- 10
- c. 10 – 20
- d. 20 and above

Q12. How much rent is paid by driver to the auto owner/ day?

- a. 200 - 400
- b. 400 -600
- c. 600 and above

Q13. What is the maintenance cost/ vehicle/ month of 2 stroke (petrol/CNG/LPG/Diesel) engines?

- a. 500 – 1000
- b. 1000 – 2000
- c. 2000 – 3000
- d. 3000 and above

Q 14. What is the maintenance cost /vehicle/ month of 4 stroke (petrol/CNG/LPG/Diesel) engines?

- a. Less than Rs 500
- b. Rs 500- Rs 1000
- c. Rs 1000-Rs 1500
- d. Rs 1500 and above

Q15. Are there any other charges/bribes/penalties paid on ground?

- a. Yes
- b. No

Q16. How much are the other charges/bribes/penalties paid on ground? To which agency ?

- a. Less than Rs 10
- b. Rs 10 – 20
- c. Rs 20 -30
- d. Rs 30 and above

Q17. What are the reasons for bribes/ penalties/other charges?

- a. Overcrowding
- b. Inadequate documents
- c. Other reasons

Q 18.What is the designated infrastructure provided?

- f. Designated parking area (parking charges?)
- g. Workshops (Numbers ?)
- h. Rest rooms/areas for drivers
- i. Training schools
- j. Others

Q19. What are the means of collecting revenue (apart from passenger revenue)?

- e. Advertisement
- f. Renting on – special events like rallies etc
- g. Renting through Schools/ organisations
- h. Others

How much is collected/ month?

Q20. What are the social benefits provided to the auto drivers?

- e. Home
- f. Medical facilities
- g. Discount on daily need items
- h. Education facilities
- i. Insurance(Rastriya Swasthya Bima Yojna)
- j. Others

Q21. Which ACT shall be amended for your betterment? Why?

Q22. Is there any dress code/uniform for drivers?

- a. Yes
- b. No

Q 23. Are the drivers associated with unions?

- a. Yes
- b. No(Reasons )

Q 24.What is the age group of people using auto?

- a. 1-15 years
- b. 15-30 years
- c. 30- 50 years
- d. 50 years and above

Q 25 . Gender usage: Male/Female

Q26. . Educational qualification of drivers

- a. Primary
- b. Secondary
- c. Higher secondary
- d. Graduation and above
- e. Illiterate

Q 27. . What is the method of financing of IPT loans? (Private and nationalised banks)

Q28. What is the rate of interest and documents required for both private and public sector banks giving loans?

Q29. Suggestions for improvement

- a. Infrastructure
- b. Finance
- c. Insurance/pensions
- d. Training programmes
- e. Use of modern technology



**IPT Policy Questionnaire  
USERS**

Age-

Occupation-

City-

State-

Full name-

Email ID-

Q 1. What are the various modes of IPT in your city?

- a. Shared Auto
- b. Private Auto
- c. Battery operated
- d. Others

Q2. What is the purpose of your travel?

- a. Work trip
- b. School trip
- c. Social trip
- d. Others

Q3. What is the average distance travelled by IPT per day?

- a. 0 – 5 kms
- b. 5 – 10 kms
- c. 10 – 15 kms
- d. 15 kms and above

Q4. Is the IPT services provided in your city 24x7?

- a. Yes
- b. No
- c. Can't say
- d. Others

Q5. How much you spend per month for the usage of IPT?

- a. Less than Rs 500
- b. Rs 500-Rs 1000
- c. More than Rs 1000
- d. Others

Q6. Are there any modern technology provided for security and safety in IPT vehicles?

- a. Yes
- b. No
- c. Others

Q7 is there safety and security in IPT vehicles?(Men/ Women)

- a. Yes
- b. No

Q8. Reasons for usage of IPT other than public transport

- a. Accessibility
- b. Convenience
- c. Comfortable
- d. Others

Q 9. What are the other security features to be added in IPT vehicles?

- a. GPS
- b. Helpline
- c. Panic Button
- d. Others

Q10. Suggestions for organising services of IPT?

## **Annexure 3: Detail City Analysis**

# City Analysis- Ahmedabad

## City Profile - Background

Ahmedabad is the largest city and also termed as the commercial capital of Gujarat. It is a megacity and rated as the fastest growing city of India. It has a population of 62,40,201 (Census, 2011).

## Transport scenario

There are a wide variety of transport modes used in Ahmedabad. Cars, 2 wheelers. Bicycles. IPT, Chakkdas (larger 3 wheeled IPT), city bus service AMTS (initiated in 1947, operates 1022 buses on 194 routes) and BRTS (initiated in 2009) are used to meet daily travel needs of the residents of Ahmedabad. Also metro rail service connecting Ahmedabad and Gandhinagar is proposed for the future.

The total number of registered IPT in the city is approximately 60,000 (RTO Ahmedabad, 2005-2011). Trip characteristics show that 28.07% trips are made by walking, 16.72% on bicycle, 9.29% by auto rickshaw, 9.67% by Public transport (PT) and around 34% by private motorized transport (CEPT, 2007).

## IPT System

There are 2 types of IPT functioning in Ahmedabad City

### Auto rickshaw (3 seater capacity) –

This type of auto rickshaw is the commonly found auto rickshaw which operates as personally hired vehicle. It provides connectivity from one destination to another in the city on a pre-decided per km meter based fare system. They are generally used by users as an access or egress mode to the formal PT system or are also used as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another. 3 seater capacity IPT also ply as “shuttles” in some areas accommodating more than 3 passengers to

even 6 passengers as an illegal practice, charging Rs. 5 – 25 from one stop to another. These are mostly found in areas where public transport is missing or outskirts of the city.

### **Chakkdas /Tempos (6 seater capacity) –**

This type of IPT are commonly known as “chakkdas” and are larger vehicles than the usual 3 seater auto rickshaw. They generally operates as shuttle auto service on a pre-decided fixed fare basis, charging on an average Rs. 5 -7 from one stop to another. They ply on fixed routes as point to point service. However, operating as shuttles, they generally seat 8 – 10 passengers and operate illegally. These type of shuttle services begin operating at around 7.30 am in the morning till 10.30 am (morning peak hours)making continuous trips on the route after which they reduce their frequencies and wait at important locations after which they resume again around 4.40 pm till 8.30 pm (evening peak).

### **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city. Though aware, of the shuttle system prevailing in the city, the authorities are not stringent about the violations.

### **Routes and fares**

The routes of IPT are not fixed by the RTO. However the fare structure is fixed by the RTO by notification from the government on basis of rise in fuel prices. Fares are regularly revised at a period of 1 year. Metered IPT run in Ahmedabad. The minimum fare is Rs 13 during day and Rs 20 at night. At some routes 3 seater autos also run on shared basis and charges Rs 5-Rs 25 from one point to other. However the 6 seater IPT though does not have any fixed route from the RTO, still follows a fixed route pattern decided from the union and pre fixed fare structure, charging Rs 5-7 per passenger. The 6 seater autos act more as a substitute of public transport at few locations in the city. These are mostly found on the outskirts of the city.

### **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.350 along with the following documents:

- Filled PCOP form (application form) to the Regional Transport Officer.
- Residence Proof
- Minimum 8th standard Pass certificate
- Court stamp Rs.10 Rupee
- Driving license
- Fitness certificate
- Insurance - vehicle insurance
- Pollution under control certificate.
- Meter No / Bill. Meter should be compulsory
- Permit fee

The time taken for processing is less than 15 days from the date of application. The permit is renewed after every 3 years at a payment of Rs 200.

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act and Gujarat state motor vehicles Rules. (Annexure 1)

### **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. Though IPT stands and few dedicated tracks have been provided by Municipal Corporation at few locations of the city, but they are currently inadequate and at many places inappropriate. Also these are blocked by encroachment. Therefore IPT still queue up seeking potential passengers at critical junctions, thus contributing to congestion levels. Also no workshops or repairing shops are provided for repair of IPT Vehicles.

## Vehicle characteristics

About 60 % of the auto rickshaw within the city limits of Ahmedabad uses CNG gas and have 4 stroke engines. Though conversions from 2 stroke to 4 stroke engines have already started, but still about 25 % of the IPT are 2 stroke CNG run and 15 % are petrol 2 stroke engines which are run on the

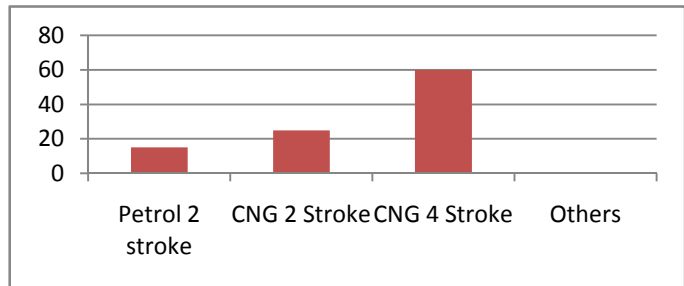


Figure 1 Type of Vehicle

outskirts. This is because the average maintenance cost per month in case of 4 stroke engines is Rs 1500 whereas in case of 2 strokes the average cost per month is Rs 750.

## Sample size for Auto rickshaw drivers and users survey

Surveys were carried out for drivers and users of IPT in Ahmedabad city, 60 surveys for drivers and user surveys through random sampling method were conducted at important locations of Ahmedabad, for the research purpose. Survey locations were selected according to major locations where presence of IPT and its movement and on some of the busiest areas like Kalupur Railway Station, Geeta Mandir ST bus, University area ,Paldi bus stand, Kuber Nagar, Ambawadi.

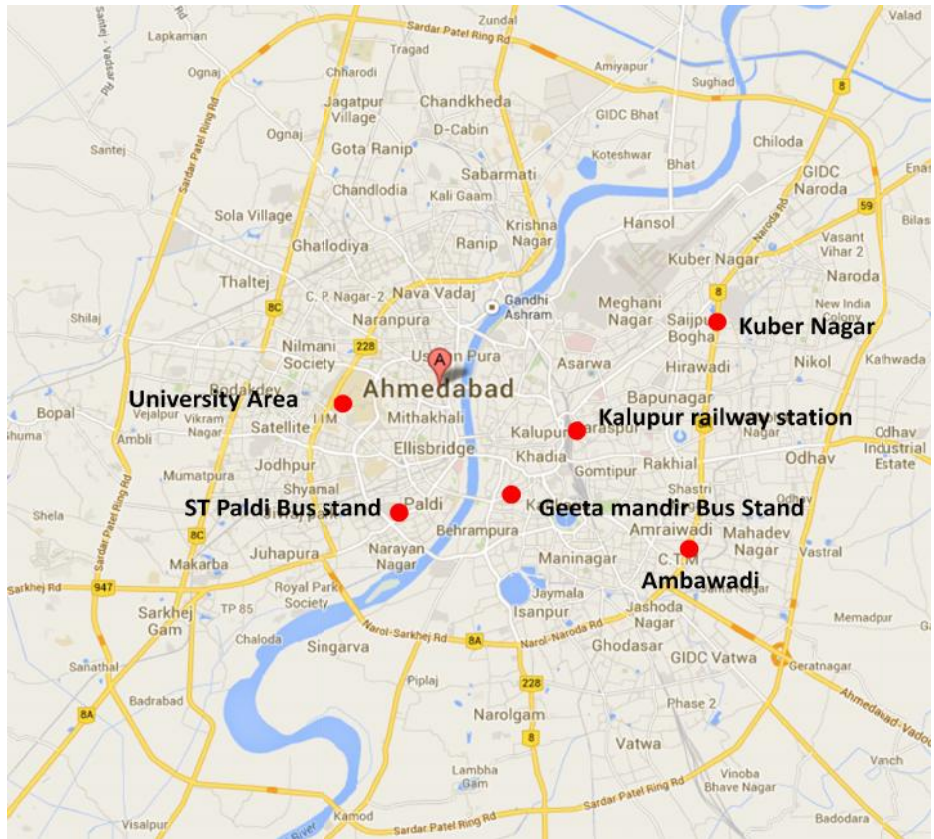


Figure 2 Survey Locations

## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

### a. Ownership of Vehicles

About 68% of the drivers surveyed at various locations of the city stated that they have rented the auto rickshaw they drive. Ownership in Ahmedabad is 32%. The main reason being that, they have not enough money to purchase

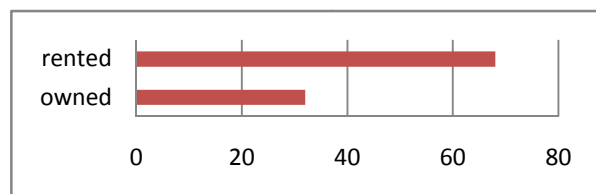
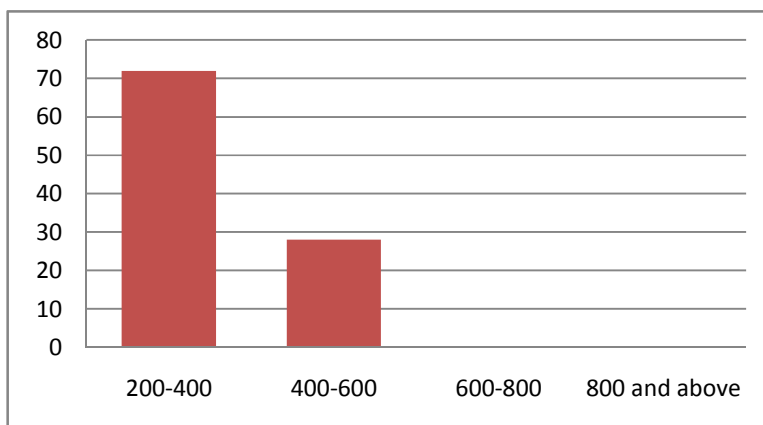


Figure 3 Ownership of vehicles

an auto rickshaw and purchasing an auto rickshaw through a loan from banks is a lengthy and a tedious process due to too much documentation required (Documents required are given in section g). It is also observed that out of the owners majority owns about 1- 5 IPT and few own more than 5 IPT. Also the rent paid by the drivers to their owners is Rs 200 daily.

**b. Revenue earned per day**

72% the drivers stated that the revenue collected per day varies between Rs 200- Rs 400. The average earning per month is Rs 9000. However of about 28% of the shuttle drivers said that the revenue collected per day varies between Rs 400 to Rs 600. The average income



**Figure 4 Revenue earned per day**

earned per month is therefore Rs 15,000. The main reason for such variation in revenue collection is because the shuttle services carries illegally greater number of passengers compared to the actual design of vehicles and also these drivers charge more fares from users as these services are mostly present in areas where there is absence of public transport. However the IPT that are rented have to pay an amount of Rs 200 per day to their owners from the daily earnings. Other than fare box revenue few of the IPT has school permit and carry school children. These IPT charge per student an amount of Rs 350 for first 1 kms and increases at rate of Rs 50 /km. A maximum of 6 students are allowed to be carried. Comparative table showing earning of shuttle and general IPT are given below:



Table 1 Revenue earned per month

Descriptions		Earning per day	Average earning per month	Rent/day	Total earning per month
Income in case of rented IPT	General services	Rs 200- Rs 400	Rs 9000	Rs 200	Rs3000
	Shuttle services	Rs 400- Rs 600	Rs 15000	Rs 200	Rs. 9000
Income in case of owned IPT	General services	Rs 200- Rs 400	Rs 9000	-	Rs 9000
	Shuttle services	Rs 400- Rs 600	Rs 15000	-	Rs 15000
Income in case of rented IPT+ school permit	General	Rs 200- Rs 400 + Rs 120**	Rs 3000+Rs 3600 *	Rs 200	Rs 6600
	Shuttle services	Rs 400- Rs 600+Rs 120 **	Rs 9000+ Rs 3600 *	Rs 200	Rs 12600
Income in case of owned IPT+ school permit	General services	Rs 200- Rs 400 + Rs 120**	Rs 9000+3600*	-	Rs 12600
	Shuttle services	Rs 400- Rs 600+Rs 120 **	Rs 15000+3600*	-	Rs 18600

\*Maximum distance travelled of students to reach school is within 5 kms radius.

\*\* These IPT charge per student an amount of Rs 350 for first 1 kms and increases at rate of Rs 50 /km. Maximum of 6 students are carried according to permit given.

**c. Average length travelled by auto per day**

About 80 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms and only 20 % stated that the average length travelled to be between 100-150 kms.

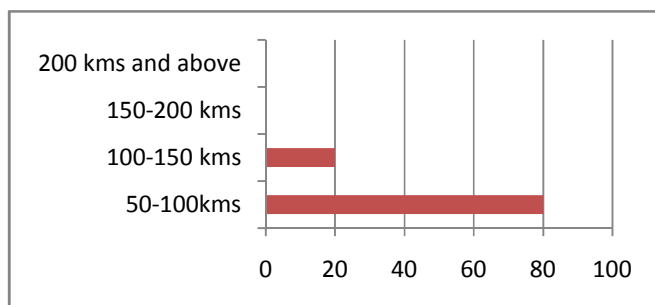
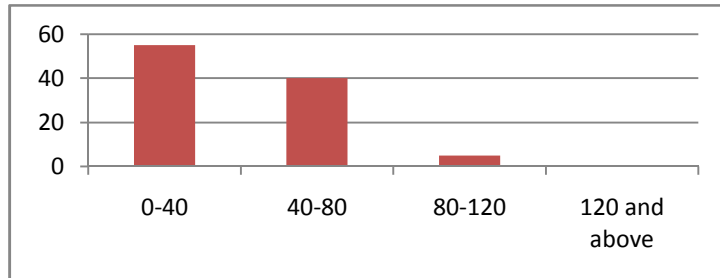


Figure 5 Average length travelled /auto/day

**d. Passengers travelled per day per auto**

It is stated that about 55% of drivers carries not more than 40 passengers per auto per day. 40 % of drivers states that they carry between 40-80 passengers per auto per day. This difference is due to shuttle services or the chaddkas

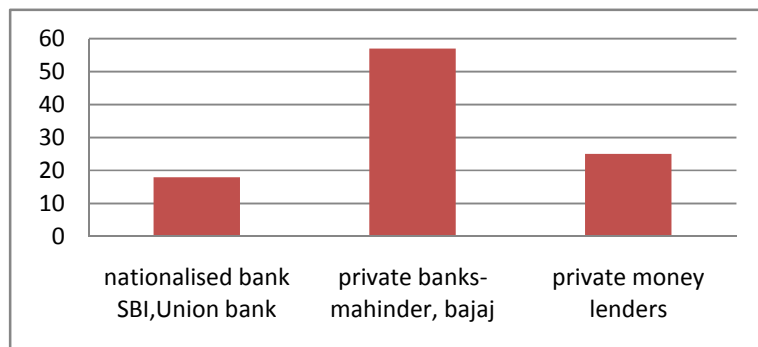


**Figure 6 Passengers travelled per day per auto**

running at few locations of the city. Only 5 % of drivers carry more than 100 passengers. This is due to illegal practices of carrying people.

**e. Funding Provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents<sup>1</sup> required by the banks to finance the loan.



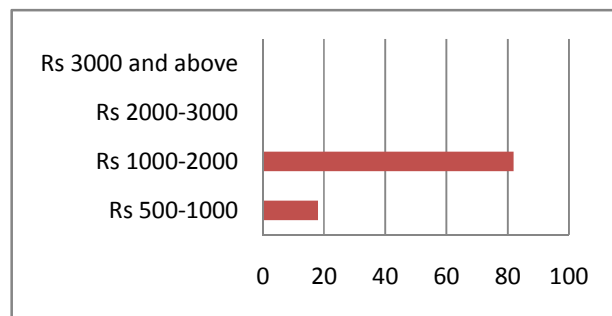
Hence the driver feels it easy to **Figure 7 Financing IPT**

<sup>1</sup> Nationalized banks documents required- address proof, ID proof, pan card details, previous loan repayment track record, guarantor, bank statement for last 6 months, IT returns.

resort to a private financier<sup>2</sup> even though the financier charges higher interest of 22 -25% as compared to nationalised banks which charge from 10.5- 12.5%. Some of the common financiers are Indus land bank, Kotak Mahindra Finance and other private lenders etc. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 57% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks even though it being a legal procedure.

**f. Maintenance cost of vehicles.**

About 82 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 1000 to Rs 2000 (Average Rs 1500/ month). Whereas only 18 % stated that the cost of maintenance of the



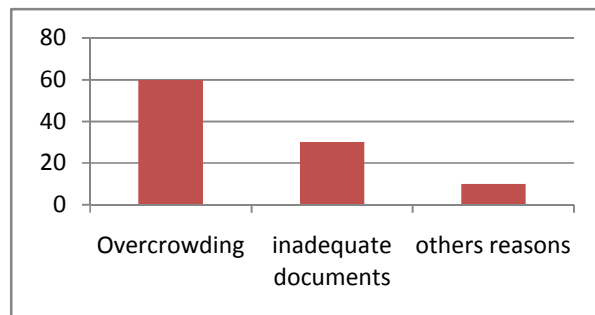
vehicles per month is between Rs 500-Rs 1000(average Rs 750 / month).The cost in

**Figure 8 Maintenance cost per month**

the latter is lower as maintenance cost of 2 stroke engines are lower.

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for traffic rule violations. The major cause for fines as found from the driver survey was overcrowding in case of shuttle operations.



**Figure 9 Reasons for bribes/penalties**

<sup>2</sup> Mandatory documents required for private lenders- address proof, photograph of borrower and guarantor, Optional documents like last 6 months bank statement, contract copies, loan repayment record, RC book photocopies for vehicles owned, property deed copy.

The other causes found out were not having adequate documents as required.

However, the traffic penalties are often converted into a source of bribe by the city traffic officials. The illegal shuttle operations found in the Ahmedabad city area, as per the driver survey states that all pay a meager amount of Rs.20 to the traffic police per week in order to keep their operations continuing.

**Table 2 Total income and expenditure of auto drivers**

Descriptions		Total earning per month (In Rs)	Maintenance cost/month*(In Rs)	Bribes to traffic police/per month(Rs)	Total expenditure /month (in Rs)	Total revenue/month (in Rs)
Income in case of rented IPT	General services	3,000	1,125	-	1,125	1,875
	Shuttle services	9,000	1,125	80	1,205	7,795
Income in case of owned IPT	General services	9,000	1,125	-	1,125	7,875
	Shuttle services	15,000	1,125	80	1,205	13,795
Income in case of rented IPT+ school permit	General	6,600	1,125	-	1,125	5,475
	Shuttle services	12,600	1,125	80	1,205	11,395
Income in case of owned IPT+ school permit	General services	12,600	1,125	-	1,125	11,475
	Shuttle services	18,600	1,125	80	1,205	17,395

\*average of maintenance cost per month taken

#### **h. Association with unions**

There are around 16 unions in Ahmedabad, out of which only 4 to 5 are registered and work actively. The association is trying to sustain itself by suggesting benefits to auto rickshaw drivers in terms of healthcare facilities, insurance, and education facilities for their children.

However, from the driver survey, when asked the reason for being not associated with any such associations, the common answer got was that there is no such benefit as to be provided by these associations except to organize strikes during fare hikes, which is in turn negative to their business and also they have to shelve out the membership fees.

**i. Other problems**

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1. As per the driver's survey 48% of the drivers have obtained primary education 34 % secondary, 10% graduate and 8 % are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, education facilities

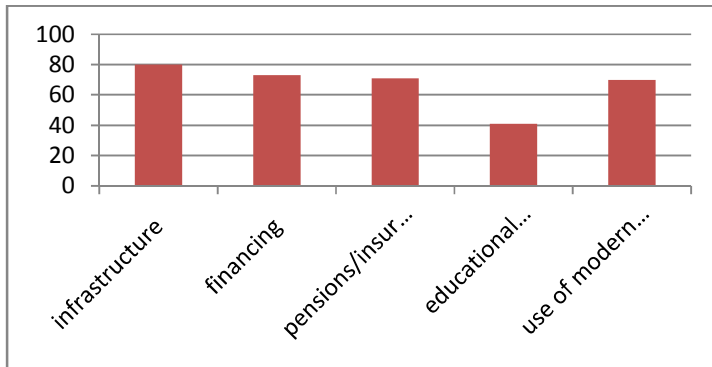
**j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

**Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 80% respondents in Ahmadabad suggested for provision of auto rickshaw stands at appropriate locations for their improvement which enables access to get passengers easily, which in turn would also reduce the hassles they have to deal with traffic police on daily basis for encroaching the roads while waiting for potential passengers at critical locations.



**Figure 10 Suggestions for improvement**

### **Financing**

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out daily rent which decreases their revenue earnings. Hence a common criteria that both the auto rickshaw drivers and unions (73%) suggested that the legal financing procedure of IPT should be made easier. And also they suggested that it would be better if government comes up with beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

### **Pensions/Insurance**

An auto rickshaw driver feels that though it is a business, in a way he is doing a public service, and so he should be offered benefits in terms of government scheme pensions so that he does not feel insecurity for his future. 70% respondents in Ahmedabad feel that they should be given pension/insurance for their future security.

### **Training Programmes:**

About 41% of respondents in Ahmedabad agreed to undergo training and educational training programmes for providing better service to customers.

## **Usage of modern technology**

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then 70% of the drivers suggested for such improvement to be added.

### **k. Summary of findings from drivers survey**

---

- 1.** A general auto rickshaw driver on an average earns Rs. 200- 400 per day which does and Rs 400- Rs 600 for shuttle services which does not enable him to provide a better future to his family (Refer table1 and 2). Also the earning from rented IPT is lower than owned rickshaws. However the autos doing dual work like working with school permit and passenger's movement permit earn more compared to the normal IPT. It is also observed that general 3 wheeler autos drivers do not even earn the minimum wages as fixed by the Labour Welfare Department of Gujarat ( Rs 6810 per month).Therefore these are said to be the worse sufferers.
- 2.** It is also seen from the above study that maintenance cost is higher for four stroke engines ( average Rs 1500 per month) compared to 2 stroke engines(average Rs 750 per month), therefore do not prefer to convert their vehicles to 4 stroke.
- 3.** Lack of proper infrastructure facilities like auto stands, parking areas, workshops for repairs etc.
- 4.** From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 22-25%.But since the earning is low therefore the drivers cannot repay back

the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.

5. Since the educational levels are lower therefore computerized driving test are not possible to be given.
6. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.

## Users survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 60 users on the basis of random sampling was carried out, at various locations. by selecting various characteristics that they associate with this IPT mode

### a. Age group of users

From the survey it has been observed that above 20 years all age groups of people use the IPT services. About 44% of the surveyed users belong to the age group of 30 to 40 years. Only 25 % belongs to the age group between 20- 30 years. Above the age group of 40, 31 % use the IPT. as it provides door to door services for elderly citizens.

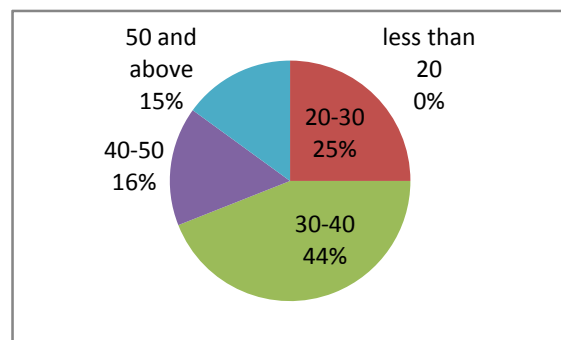


Figure 11 age profile of users

### b. Occupations of users

From the survey it is observed that more than 50 % of the users belong to the private firms, NGOs and business class. About 17 % of the government uses IPT services and

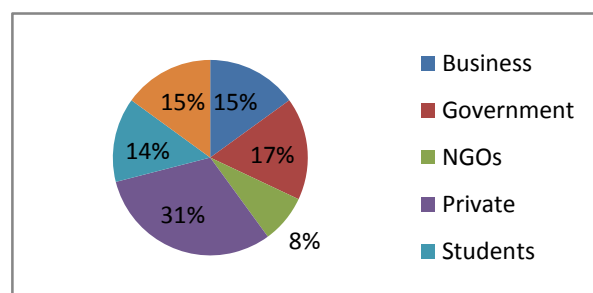


Figure 12 Occupation



about 15 % each user belong to students and house wife categories.

**c. Purpose of trip by IPT**

It has been observed that 50 % of the trip purposes for which these IPT services are used are for work purpose and 48% for social purpose. Only 2% uses for educational trips.

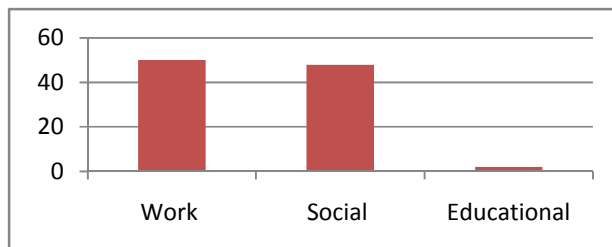


Figure 13 Trip purpose

**d. Average distance travelled by passengers**

It has been observed that majority (85%) of users travel by the IPT are for small to medium distance trips of not more than 10 kms. However about 10% of the users travel more than distance of 10 kms and above, as some population also migrate out for employment to the nearby SEZ and industrial areas that have developed.

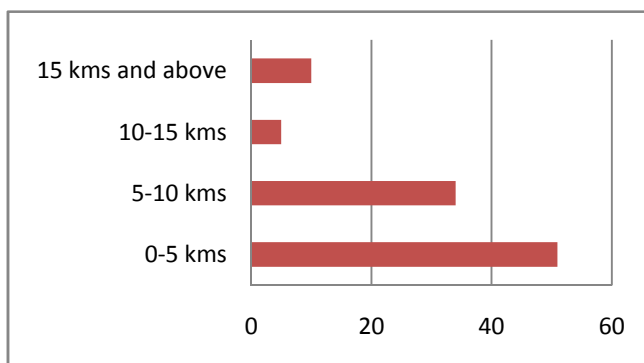


Figure 14 Average distance travelled by users

**e. Expenditure per month**

From the survey it has been observed that about 81 % of users spend monthly of not more than Rs 1000 for using IPT services. However only 19 % spends more than Rs 1000, This 19 % people were found to travel more distance as a result

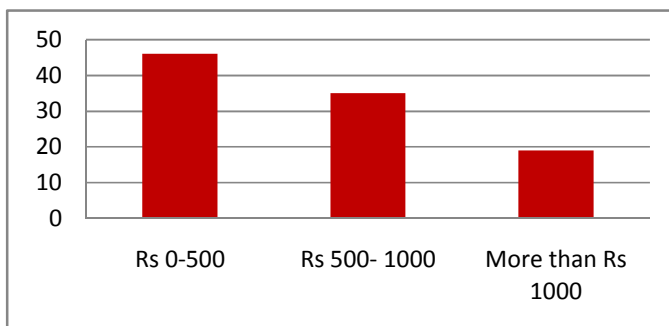


Figure 15 Expenditure per month

more money is spend on IPT.

#### f. Safety and Security

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It has been stated that 86% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore very high. The shuttle services that operates in city outskirts.

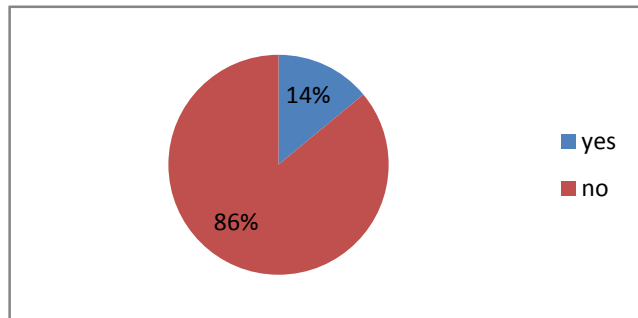


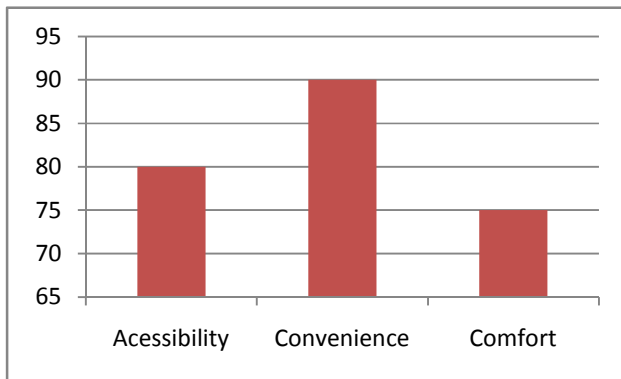
Figure 16 safety and security mechanism in IPT vehicles

#### g. Reasons for usage of IPT other than Public transport

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This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

- 1. Accessibility:** Nearly 80% respondents found IPT to be more accessible. The main reason being continuous availability of auto rickshaw whenever required at all locations.
- 2. Convenience:** Another characteristic associated with their preference was convenience. Around 90% respondents find IPT to be more convenient again for the main reason being its easy availability. Also it provides the last mile / very near to last mile connectivity, and can be also opted for exact origin to destination connectivity, which makes their overall journey very convenient when compared to public transport where they are required to walk and wait for the bus availability at the stop which are many times not designed properly. Also they are required to make mode interchanges at times to reach their destination which they find inconvenient



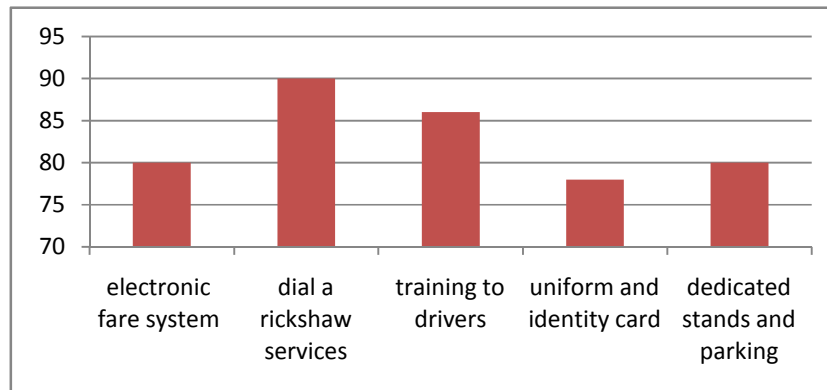
**Figure 17 Reasons for usage of IPT**

- 3. Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus (in case of shuttle IPT), and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. 75% of the respondents using Ahmedabad meter auto said that it is comfortable. However the shuttle service users complain of dis comfort as more passengers are illegally carried

#### **h. Other Suggestions for organizing services of IPT**

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1. Usage of modern technology- About 80% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.
  - a. When users were made aware of the usage of old panic button, dial a rickshaw services then about 90% passengers are willing to use the services.



**Figure 18 other suggestions**

- b.** Training to drivers on road safety and driving skills were also agreed by about 86 % of the users. As the drivers often drive rashly according to passenger's perception.
- c.** 80 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion on busy roads.
- d.** About 78 % of users agreed that uniform dress code and identity card to all drivers make it safe for users using the service as lot of crime takes place in the city.

**i. Summary of findings from Users survey**

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1. Charging of higher fares as the metered autos are not electronic therefore drivers often manipulate the readings leading to dispute between users and drivers
2. Due to absence of dedicated auto rickshaw stands and parking areas often there is found chaos and congestion on roads.
3. Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services after evening.

# City Analysis- Kolkata

## City Profile - Background

Kolkata is the capital city of state of West Bengal. It is located on the east bank of the Hooghly. It is the principal commercial, cultural, and educational centre of East India. It has a population of 1, 41, 12,536 (Census, 2011).

## Transport scenario

There are a wide variety of transport modes used in Kolkata -Cars, 2 wheelers. bicycles. IPT (3 wheeled) , city bus service(1331 in operation) and metro railway are used to meet daily travel needs of the residents of Kolkata. Also the east west metro rail service connecting Sector V to Howrah is presently under construction.

The total number of registered IPT in the city is approximately 10,300 (RTO Kolkata, 2012). The modal share for the city of Kolkata shows that 19% trips are made by walking, 11% on bicycle, 4% by auto rickshaw, 54% by Public transport(PT) and around 12% by private motorized transport (Wilber Smith Report ,2008).

## IPT System

The type of IPT functioning in Kolkata City is

### **Auto rickshaw (3 seater capacity) –**

This type of auto rickshaw is the commonly found auto rickshaw which operates on a shared basis from one destination to another in the city on a pre-decided route fixed by RTO and fare decided by the unions. They are generally used by users as an access or egress mode to the formal PT system or are also used as a competitor to public transport or as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another. 3 seater capacity IPT ply as “shuttles” in all areas of cities accommodating more than 3

passengers to even 5 passengers as an illegal practice, charging Rs. 7 – 25 from one stop to another. Very rarely these 3 wheelers acts as personalized modes at times of emergency like travelling with heavy luggage's etc.

### **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city. Though aware, of the three wheeler system prevailing in the city, the authorities are not stringent about the violations and the number of illegal IPT that are running in the city.

### **Routes and fares**

The routes of IPT are fixed by the RTO. The routes of these IPT are generally fixed and 90% are found to travel a distance up to only 10 kms. In total there are 125 routes with a fleet strength varying from 10 to 500 approximately. The highest fleet strength depends on areas where the route is the busiest like railway station, main CBD areas etc. and number decreases with decrease in demand of areas. Though the fleet strength is fixed by RTO but often it is complained by drivers that the fleet size in a particular route has increased due to political backing.

The fare structure is fixed by the trade unions. The revision of fare is done based on increase in cost of LPG gases, but not on a regular basis. The minimum fare is Rs 7 and maximum is Rs 25 per person. Though there is a meter system provided in IPT but due to political reasons and efforts the meters do not work.

### **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.350 along with the following documents:

- Filled application form to the Regional Transport Officer.
- Residence Proof
- Age proof certificate

- Financial capability
- Bank account statement
- Driving license

The time taken for processing is less than 1.5 months to 2 months from the date of application. The permit is renewed after every 5 years at a payment of Rs 200. Penalties are charged according to the days of delay in the renewal process( Rs 1000 after 90 days).

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and West Bengal State Motor Vehicles Rules.

### **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. No IPT stands or dedicated tracks have been provided in the city. The stands that are found in the city are demarcated by the auto unions themselves based on the availability of road space on each route, resulting in queuing at critical junctions and thus contributing to congestion levels. Also no workshops or repairing shops are provided for repair of IPT Vehicles.

### **Vehicle characteristics**

In order to meet the pollution standards in the year 2000 there was a sudden conversion notifications issued by the High court of Calcutta after which all 2 stroke IPT were converted to 4 stroke LPG in order to control pollution levels. Government provided subsidies for the conversion.. At present all the IPT found in the city are running on 4 stroke LPG fuel.

### **Sample size for Auto rickshaw drivers and users survey**

Surveys were carried out for drivers and users of IPT in Kolkata city. 100 surveys for drivers and user were conducted through random sampling method at few of the locations based on the busiest, medium and low used routes of city. Survey locations are Howrah Railway Station, Interstate bus terminals, Sector 5, Ballaguange Phadi , Jadavpur Univeristy, Dhramatala

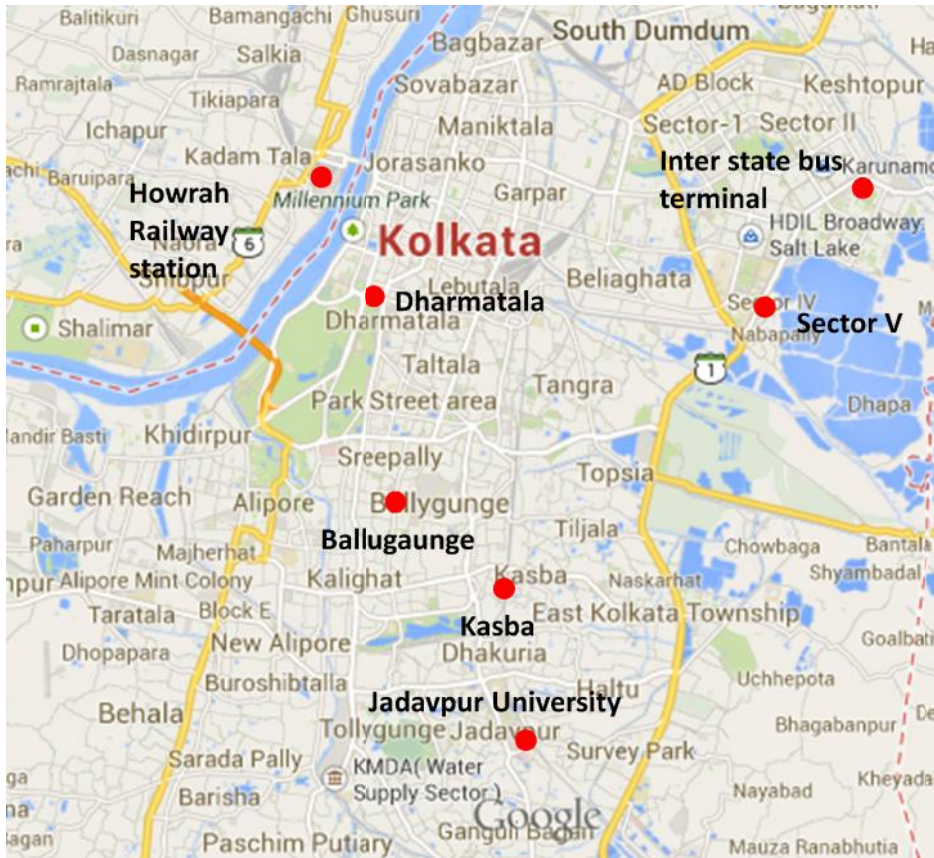


Figure 19 Survey Locations

## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.



### a. Ownership of Vehicles

About 70% of the drivers surveyed at various locations of the city stated that they have rented the auto rickshaw they drive. Ownership in Kolkata is 30%. The main reason being that, they have not enough money to purchase an auto rickshaw as most of the people who drive

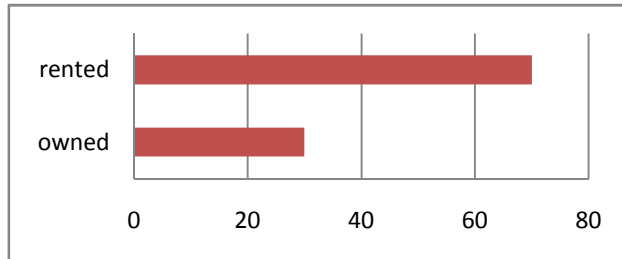


Figure 20 Ownership of vehicles

the rickshaws are migrants from Bihar and Orissa and second reason purchasing an auto rickshaw through a loan from banks is a lengthy and a tedious process due to too much documentation required (Documents required are given in section g). It is also observed that out of the owners majority owns about 2-4 IPT. Also the rent paid by the drivers to their owners is Rs 250 daily.

### b. Revenue earned per day

82% the drivers stated that the revenue collected per day varies between Rs 600- Rs 800. The average earning per month is Rs 21,000. However at times the income

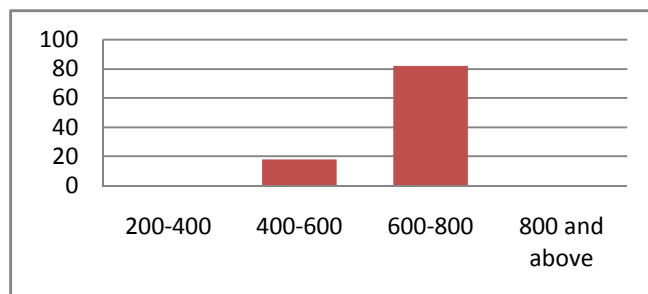


Figure 21 Revenue Earned per day

increases beyond Rs 21,00 in these shuttle services as near the

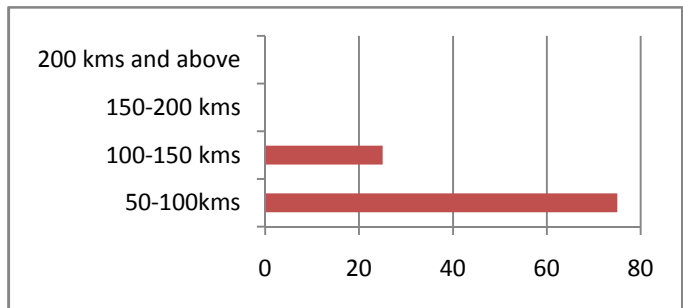
outskirts of the city around 5-6 persons are carried on illegal basis. Also in areas where there is absence of public transport, the drivers charge higher fares from individuals. Also the IPT that are rented have to pay an amount of Rs 250 per day to their owners from the daily earnings. Other than fare box revenue no other permissions for revenue generation like advertisements, participation in rallies, schools etc are given by the government. Comparative table showing earning of rented and owned IPT are given below:

**Table 1. Revenue earned per month**

Descriptions		Earning per day	Average earning per month	Rent/day	Total earning per month
Income in case of rented IPT	Shuttle services	Rs 600- Rs 800	Rs 21,000	Rs 250	Rs13,500
Income in case of owned IPT	Shuttle services	Rs 600- Rs 800	Rs 21,000	-	Rs 21,000

**c. Average length travelled by auto per day**

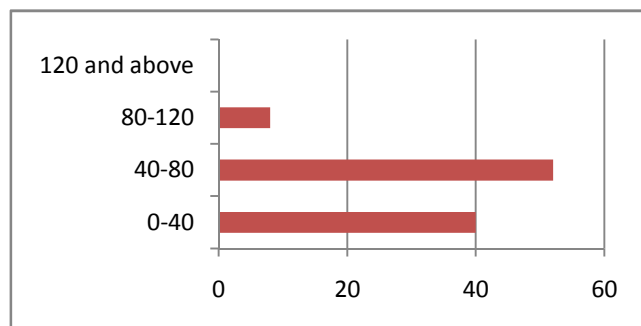
About 75 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms and only 25 % stated that the average length travelled to be between 100-150 kms.



**Figure 22 Average length travelled /auto/day**

**d. Passengers travelled per day per auto**

It is stated that about 52% of drivers carries between 40-80 passengers per auto per day, as the IPT run on shared basis. Only 8% carries more than 80-120 passengers per day per auto, this due to overloading of passengers in the outskirts of the cities. In this case the drivers carry more than 3 passengers up to 6 passengers at a time.

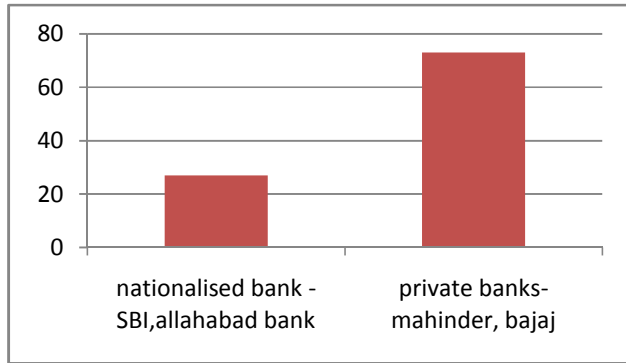


**Figure 23 Passengers travelled per day per auto**

is

**e. Funding Provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents\* required by the banks to finance the loan.



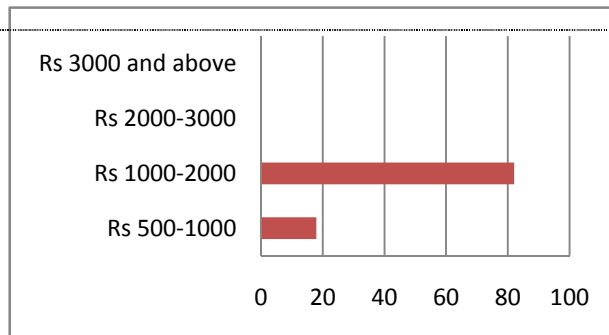
**Figure 24 Financing IPT**

Hence the driver feels it easy to resort to a private financier\*\* even though the

financier charges higher interest of 20 -25% as compared to nationalised banks which charge from 10.5- 12.5%. Some of the common financiers are State Bank of India, Allahabad Bank, Bajaj finance and Kotak Mahindra Finance. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 73% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks even though it being a legal procedure. However the percentage of loans from the nationalised banks is higher compared to any other cities because during the time of conversions from 2 stroke to four stroke government tied up these banks and provided loans at lower interest rates.

**f. Maintenance cost of vehicles.**

About 80 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 1000 to Rs 2000. The average maintenance cost per month is Rs1500. 20 % stated that the cost of maintenance of the vehicles per month



**Figure 25 Maintenance cost per month**

is from Rs 500-Rs 1000 (average Rs 750 /month) as these drivers uses good quality spare parts for maintenance of vehicles.

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for traffic rule violations. The major cause for fines as found from the driver survey is route violations, standing in no parking areas and sometimes absence of adequate documents as required.

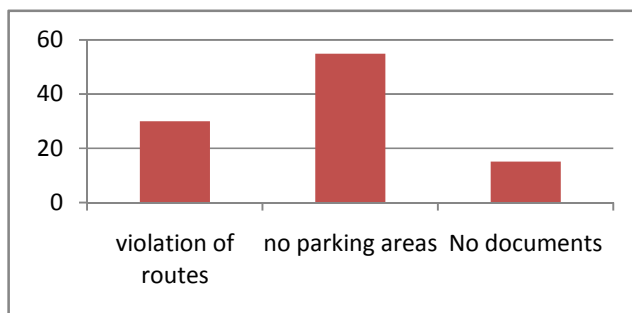


Figure 26 Reasons for bribes/penalties

However, the traffic penalties are often converted into a source of bribe by the city traffic officials. Due to standing in no parking areas therefore charge of Rs 250 is charged from drivers. Route violations are charged Rs 2000. The total income and expenditure are given below:

Table 2. Total income and expenditure of auto drivers

Descriptions		Total earning per month (In Rs)	Maintenance cost/month*(In Rs)	Payment to auto unions/week (Rs)	Total expenditure /month (in Rs)	Total revenue/month (in Rs)
Income in case of owned IPT	Shuttle services	21,500	1,125	80	1,205	20,295
Income in case of rented IPT	Shuttle services	13,500	1,125	80	1,205	12,295

\*average of maintenance cost per month taken

#### **h. Association with unions**

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There are 125 registered trade unions in the city. The number of unions are so many as each of the 125 routes have a separate union following different political party ideologies. like CPM, TMC etc. The association is sustaining itself by charging Rs 20 per week from the drivers to provide benefits like education, healthcare facilities etc to the drivers. However in real terms the drivers are not very happy associating with the trade unions as they do not provide any benefits to drivers other than organizing strikes during fare hikes.

#### **i. Other problems**

---

1. As per the driver's survey 90 % of the drivers have obtained only primary education and 5% are illiterate and 5% are secondary educated . Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, and education facilities.
3. Competition increases between drivers though the routes and fleet size is fixed by RTO, as the number of autos continues to grow due to political support, even though the RTO has stopped issuing any further licenses to IPT to keep a check.
4. Though all the IPT run on LPG fuels but still not enough fuel refilling stations are provided in the city.
5. The mileage for LPG run IPT are lower 18-20km/hr on road as compared to CNG fuel of 30-35km /hr

#### **j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

---

In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

## Infrastructure

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 80% respondents in Kolkata suggested for provision of auto rickshaw stands at appropriate locations for their improvement which enables access to get passengers easily, which in turn would also reduce the hassles they have to deal with traffic police on daily basis for encroaching the roads while waiting for potential passengers at critical locations.

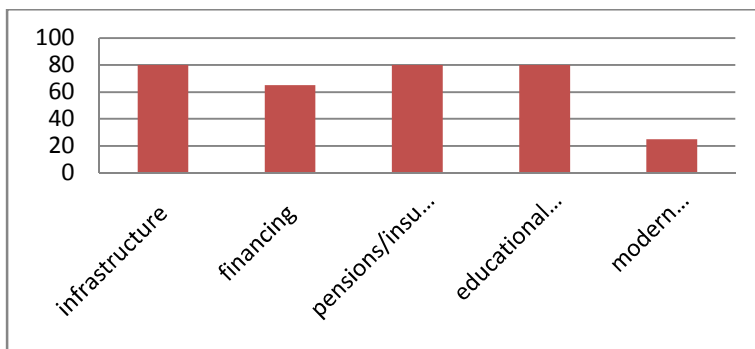


Figure 27 Suggestions for improvement

## Financing

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out money for providing charges to unions, rent to owners etc which decreases their revenue earnings. Hence a common criteria that both the auto rickshaw drivers and unions (65%) suggested that the legal financing procedure of IPT should be made easier. And also they suggested that it would be better if government comes up with beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

### **Pensions/Insurance**

About 80% of auto rickshaw driver feels that insurance should be given insurance for their future security, as the drivers are providing services to general public.

### **Training Programmes:**

About 80% of respondents in Kolkata agreed to undergo training and educational training programmes for providing better service to customers.

### **Usage of modern technology**

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then only 25 % of the drivers suggested for such improvement to be added. This response is one of the lowest as the drivers feel that the cost of the maintenance of autos will be higher with introduction of new technology and secondly if law is passed by centre for implementation of GPS in IPT then the drivers have to shelve out money from their own pockets. So the drivers do not prefer implementation of new technologies.

### **k. Summary of findings from drivers survey**

---

1. A general auto rickshaw driver on an average earns Rs. 600- 800 per day, since it runs on a shared basis and carries more than 3 passengers. Therefore the earning is higher compared to general IPT of other cities. (Refer table1 and 2).
2. It is also seen from the survey that maintenance cost is higher for four stroke engines (average Rs 1500 per month) as the spare parts are expensive and the drivers therefore prefer to buy local parts from the markets, leading to greater number of breakdowns and faults.
3. Lack of proper infrastructure facilities like auto stands, parking areas, workshops for repairs etc.

4. Though all the IPT run on LPG fuels but still not enough fuel refilling stations are provided in the city.
5. The mileage for LPG run IPT are lower 18-20km/hr on road as compared to CNG fuel of 30-35km /hr
6. Competition increases between drivers though the routes and fleet size is fixed by RTO, as the number of autos continues to grow due to political support, even though the RTO has stopped issuing any further licenses to IPT to keep a check.
7. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 20-25%. But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.
8. Since the educational levels are lower therefore computerized driving test are not possible to be given.
9. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.
10. Removal of political parties influences from the IPT unions as these are just an additional source for providing funds to the parties rather than providing benefits to the drivers.



## Users survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 100 users on the basis of random sampling was carried out, at various locations. By selecting various characteristics that they associate with this IPT mode

### a. Age group of users

From the survey it has been observed that above 20 years all age groups of people use the IPT services. About 75% of the surveyed users belong to the age group 20 to 40 years. Only 20 % belongs

to the age group between 40- 50 years. Above the age group of 50, only 5 % uses the service.

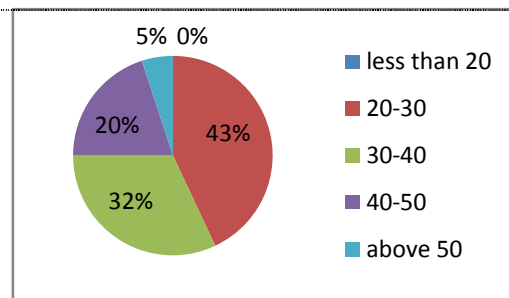


Figure 28 age profile of users

Therefore the IPT services are mostly used by the working population.

### b. Occupations of users

From the survey it is observed that more than 43 % of the users belong to the private firms. About 13 % of the government uses IPT services, students account for 18% and 12% to housewives.

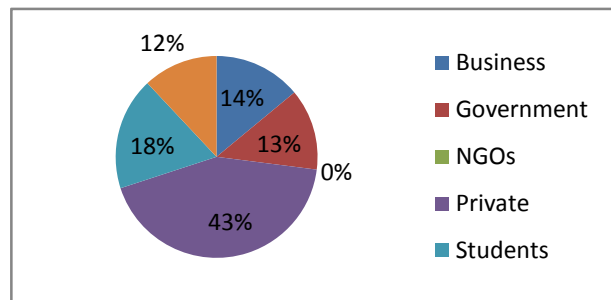


Figure 29 Occupation

### c. Purpose of trip by IPT

It has been observed that 55 % of the trip purposes for which these IPT services are used are for work purpose and 43% for social

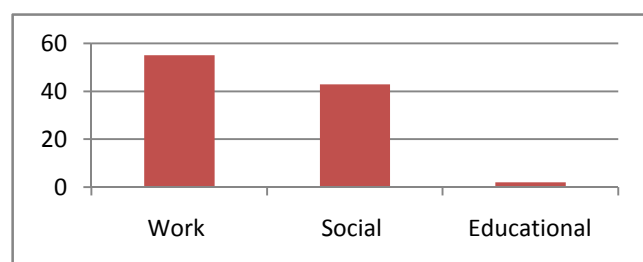


Figure 30 Trip purpose

purpose. Only 2% uses for educational trips.

#### d. Average distance travelled by passengers

It has been observed that 90% of users travel by IPT for a small to medium distance trips of not more than 10 kms as the routes are fixed by RTO. However only about 10% of the users travel more than distance of 10 kms and above.

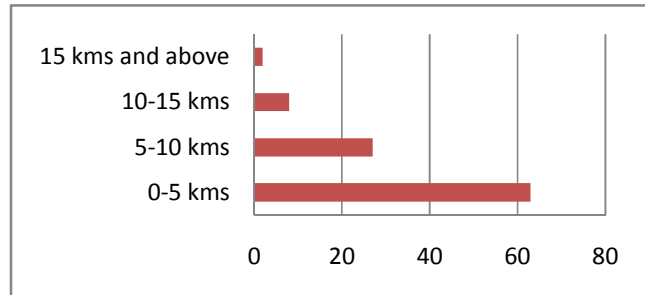


Figure 31 Average distance travelled by users

#### e. Expenditure per month

From the survey it has been observed that about 98 % of users spend monthly of not more than Rs 1000 for using IPT services. This is because the passengers travel on a shared basis. However only 2 % spends more than Rs 1000, as these passengers travel more distance.

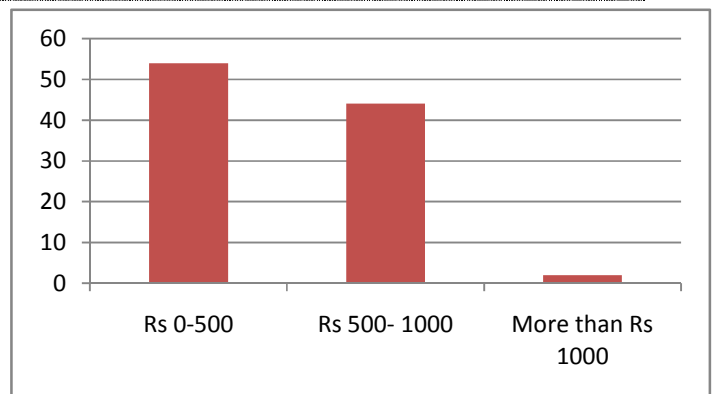


Figure 32 Expenditure per month

#### f. Safety and Security

It has been stated that 70% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher. But

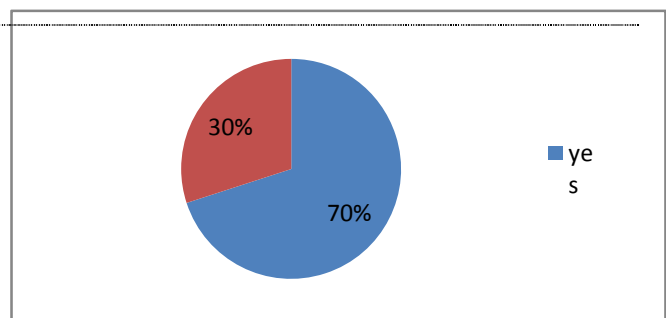


Figure 33 safety and security mechanism in IPT vehicles

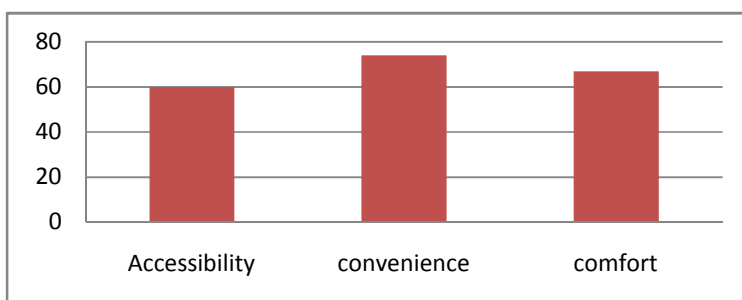
another 30% of people are of the opinion that autos are safe modes of travel as they run on shared basis.

#### **g. Reasons for usage of IPT other than Public transport**

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This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

1. **Accessibility:** Nearly 60% respondents found IPT to be more accessible. The main reason being availability of auto rickshaw whenever required at all locations, though night services are not provided. However the other 40% of users claim that it is not accessible because of the fixed routes therefore these IPT do not provide door to door services.
2. **Convenience:** Another characteristic associated with their preference was convenience. Around 74% respondents find IPT to be more convenient again for the main reason being its easy availability. Also the waiting time for these IPT are generally lower compared to the public transport therefore the overall journey becomes very convenient. The rest 26% of surveyed users believe that it's not convenient service because in order to reach the ultimate destinations the passengers have to make interchanges at various places, as the routes defined are mostly shorter.



**Figure 34** Reasons for usage of IPT

3. **Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. 67 % of the respondents using auto in Kolkata said that it is comfortable. However few users complain of dis comfort as more passengers are illegally carried and due to long waiting time at stops in order to get passengers, the users have to wait.

#### h. Other Suggestions for organizing services of IPT

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1. Usage of modern technology- About 90% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.

2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 60% passengers are willing to use the services. The other 40% believes that there will be extra transaction charges associated with the modern technology used, as a result people would not prefer to use the services.

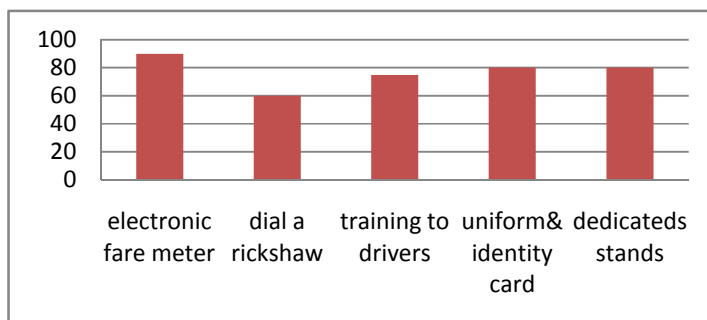


Figure 35 other suggestions

3. Training to drivers on road safety and driving skills were also agreed by about 75 % of the users. As the drivers often drive rashly according to passenger's perception.
4. 80 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion on busy roads.
5. About 80 % of users agreed that uniform dress code and identity card to all drivers make it safe for users using the service as lot of crime takes place in the city.

**i. Summary of findings from Users survey**

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1. Charging of higher fares as the fare meters do not work leading to dispute between users and drivers.
2. Due to absence of dedicated auto rickshaw stands and parking areas often there is found chaos and congestion on roads.
3. Carriage of more passengers as compared to the design capacity of the rickshaws, leading to dis comfort.
4. Long waiting time at certain locations in search of passengers leads to dis comfort of commuters.
5. Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services after evening.
6. Non availability of IPT services at night time in order to provide convenience to passengers.

# City Analysis- Alwar

## City Profile - Background

Alwar is a city and administrative headquarters of Alwar district in the state of Rajasthan. It has a population of 3.6 lakhs (Census, 2011) and is one of the most rapidly growing urban areas of National Capital region.

## Transport scenario

The burgeoning growth of the industrial base of Alwar District has been matched by a rapid growth of residential and commercial areas. This has placed great strain on the infrastructure of the city of Alwar. The gap was specifically felt in the public transport sector as the city lacks any means of public transport. The earlier means of public transport includes tempos and vikrams. Majority of these tempos are old and in poor mechanical conditions. These three wheelers were noisy, polluting, overcrowded and unsafe. Also due to medium size of the city a metro or BRT or even a city bus service is non viable .Therefore in order to solve this issue Alwar Vahini was launched in alwar with 58 vehicles on 3<sup>rd</sup> December,2011. The total number of registered IPT in the city is approximately 800 (RTO Alwar, 2012).

## IPT System

The type of IPT functioning in Alwar City is

### **Tata Magic (8 seater capacity) –**

Alwar Vahini is a passenger service of Euro IV compliant Tata Magic and Mahindra Maximmo vehicles which replaced the old tempos and vikrams. This type of auto rickshaw is the one which operates on a shared basis from one destination to another in the city on a pre-decided route fixed by RTO. These tata magic are used as a main mode of transport in the city as there is absence of public transport. These vehicles are 8 seater and at times during peak hour carries more than 8 passengers. These vehicles charge about Rs 8 – Rs 15 per passengers. .

## **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city. Though aware, of the four wheeler system prevailing in the city, the authorities are not stringent about the violations and the number of illegal vehicles that are running in the city.

## **Routes and fares**

The routes of IPT are fixed by the RTO. At present there are 25 city routes, 42 rural routes and 12 other routes. The fleet is also fixed by the RTO; about 550 permits are issued for city routes, 90 permits for rural routes and 109 permits for other routes. Though the fleet strength is fixed by RTO but it is complained by drivers that the fleet size in a various routes has increased due to political backing and illegal issue of permits.

The fare structure is fixed by the trade unions. The revision of fare is not done since its inception of the project. However after 31<sup>st</sup> March, 2014 it is decided that a committee will be formed to decide on the fares. At present the minimum fare is Rs 8 and maximum is Rs 15 per person.

## **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.1510 along with the following documents:

- Registration card
- Insurance
- Fitness certificate
- Dully filled in application form No 5.1 and 5.19 to the Regional Transport Officer.

The time taken for processing is less than 15 days from the date of application. The permit is renewed after every 5 years at a payment of same fees that is of getting a new permit. Penalties are charged according to the days of delay in the renewal process.

## **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and Rajasthan State Motor Vehicles Rules 1989.

## **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. Stands that have been created by Urban Improvement Trust for city bus services have been converted to Alwar Vahini stops. In the city about 20 bus shelters have been converted to form such stoppage areas. Also no workshops or repairing shops are provided for repair of the vehicles.

## **Vehicle characteristics**

In order to remove the polluting and noisy three wheeler vehicles, Alwar Vahini was launched in the city. These are Euro IV compliant diesel run Tata Magic and Mahindra Maximmo vehicles which replaced the old tempos and vikrams. As there is absence of public transport in the city therefore these Alwar Vahini acts as a main lifeline for the cities travel purpose.

## **Sample size for Auto rickshaw drivers and users survey**

Surveys were carried out for drivers and users of IPT in Alwar city. 10 surveys for drivers and users were conducted through random sampling method at the various routes - city , gramini and other routes of the city. Survey locations are Mewati Nagar, Shivaji park, Jyoti nagar, Ashoka talkies, Dayanand nagar and Malvia nagar



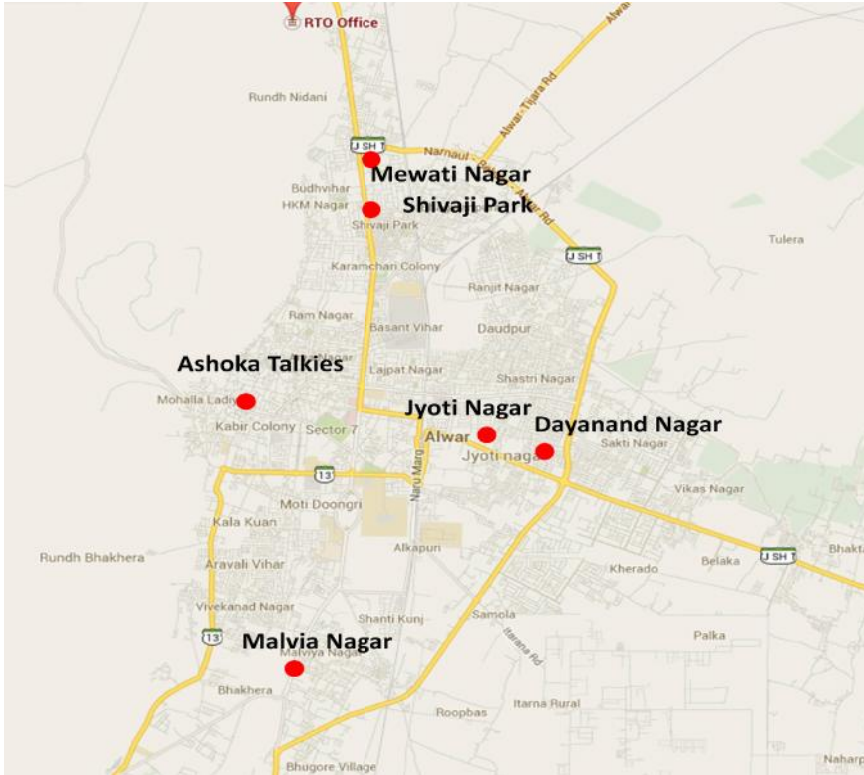


Figure 36 Survey Locations

## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

### a. Ownership of Vehicles

About 75% of the drivers surveyed at various locations of the city stated that they have owned the four wheeler they drive. Rented is only about 25%. The main reason being, due to sudden conversion of tempos and vikrams to four

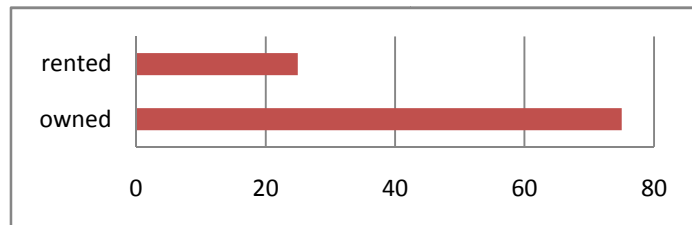
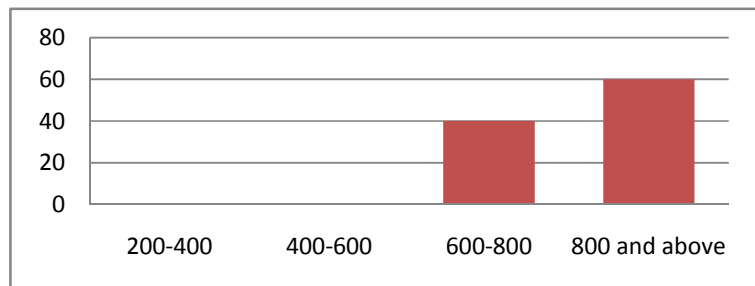


Figure 37 Ownership of vehicles

wheelers the banks have given cheaper loans to the drivers and subsidies so that the drivers can replace their old vehicles with new one. Therefore 720 old vehicles have been replaced with new four wheelers. It is also observed that the owners own at a maximum of one four wheeler. The rent paid by the drivers to their owners is Rs 400 daily.

**b. Revenue earned per day**

60 % the drivers stated that the revenue collected per day varies between Rs 800 to Rs 1100. The average earning per month is Rs 28,500. About 40% of driver



**Figure 38 Revenue Earned per day**

stated that the earning is Rs 600 to Rs 800 per day (average Rs

21,000/month), as there is not enough passengers that are found on some of the routes that are generally on the outskirts of the city as compared to the routes within the city.. Also the vehicles that are rented have to pay an amount of Rs 400 per day to their owners from the daily earnings.

Other than fare box revenue no other permissions for revenue generation like advertisements, participation in rallies, etc are not given by the government. However school permits are given to only 100 vehicles out of the total fleet of 800 approximately. These vehicles with school permit earn Rs 500 per month from the each of the students. Comparative table showing earning of rented and owned four wheelers are given below:

Table 1 Revenue earned per month

Descriptions		Earning per day	Average earning per month	Rent/day	Total earning per month
Income in case of rented IPT within city	Shuttle services	Rs 800-Rs 1100	Rs 28,500	Rs 400	Rs 16,500
Income in case of owned IPT within city	Shuttle services	Rs 800-Rs 1100	Rs 28,500	-	Rs 28,500
Income in case of rented IPT outskirts of city	Shuttle services	Rs 600-Rs 800	Rs 21,000	Rs 400	Rs 9000
Income in case of owned IPT outskirts of city	Shuttle services	Rs 600-Rs 800	Rs 21,000	-	Rs 21,000
Income in case of rented IPT within city +school permit	Shuttle services	Rs 800-Rs 1100+ Rs 16.66	Rs 28,500+Rs 500=Rs 29,000	Rs 400	Rs 17,000
Income in case of owned IPT within city+ school permit	Shuttle services	Rs 800-Rs 1100+Rs 16.66	Rs 28,500+ Rs 500=Rs 29,000	-	Rs 29,000

**c. Average length travelled by auto per day**

About 80 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms and only 20 % stated that the average length travelled to be between 100-150 kms.

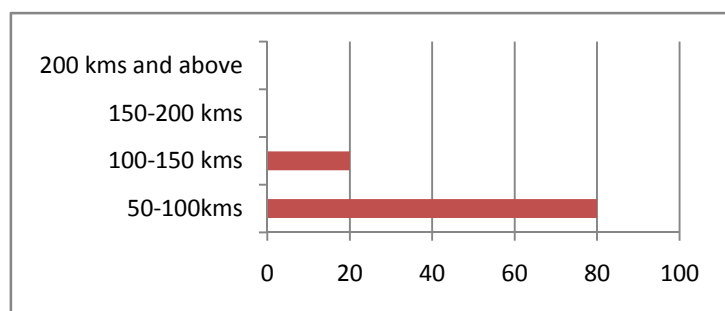
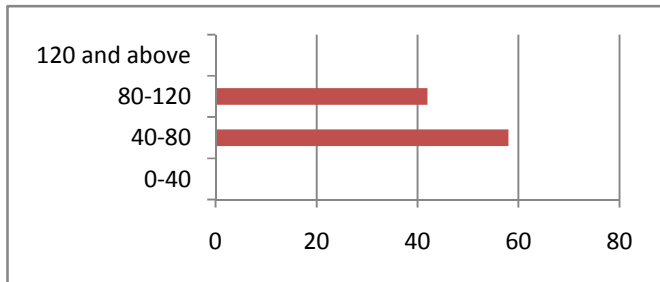


Figure 39 Average length travelled /auto/day

**d. Passengers travelled per day per auto**

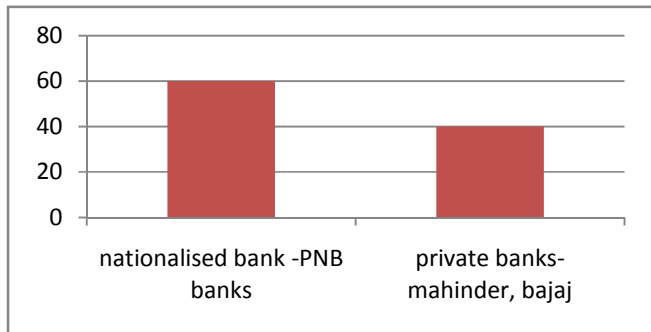
It is stated that about 58% of drivers carries between 40-80 passengers per auto per day, as these IPT run outskirts of the city. Only 42% carries more than 80-120 passengers as these routes run within the city.



**Figure 40 Passengers travelled per day per auto**

**e. Funding Provisions to operators**

From the drivers survey it has been observed that getting loans are mostly got from the nationalised bank Punjab National bank. At the launch of the project a special scheme of loan was given by the bank at 14.25% with an extended payback period of 5 years, with no collateral from the applicant and the government would act as a guarantor.

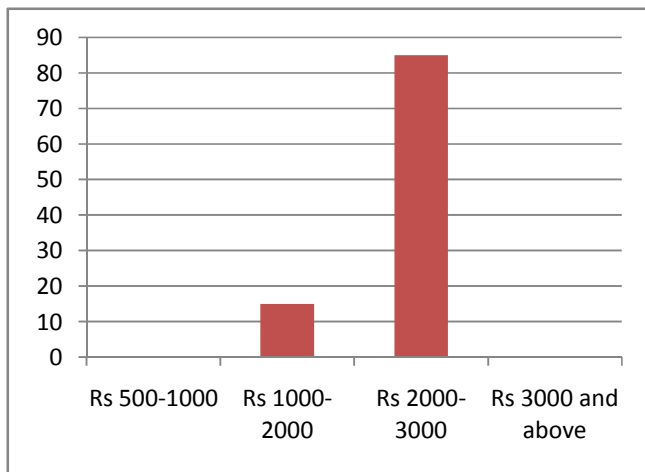


**Figure 41 Financing IPT**

Therefore about 60% of the drivers took loan from PNB (Nationalised bank). The documents required are the same as discussed in earlier chapters. 40% took loan from other private lenders like Mahindra etc at a much later stage. At a higher interest rates of 25%. (Documents required is mentioned in previous chapters)

**f. Maintenance cost of vehicles.**

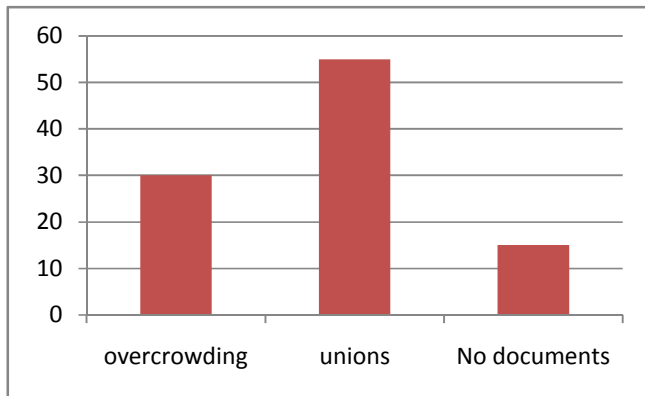
About 85 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 2000 to Rs 2500. The average maintenance cost per month is Rs 2250. 15 % stated that the cost of maintenance of the vehicles per month is from Rs 1000-Rs 2000 (average Rs 1500/month). The reason for increase in maintenance cost is due to expensive technology used in the Tata magic.



**Figure 42 Maintenance cost of vehicles/month**

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for overloading of passengers, without permit or documents etc. Rs 2000 is charged for without permit and papers and for overloading Rs 150 per extra passengers the driver has to pay.



**Figure 43 Reasons for bribes/penalties**

Also per day the unions charge an amount of Rs 25 for the welfare of the drivers. The total income and expenditure are given below:

Table 2 Total income and expenditure of auto drivers

Descriptions		Total earning per month (In Rs)	Maintenance cost/month*(In Rs)	Payment to auto unions/day (Rs)	Total expenditure /month (in Rs)	Total revenue/month (in Rs)
Income in case of rented IPT within city	Shuttle services	16,500	1875	750	2625	13,875
Income in case of owned IPT within city	Shuttle services	28,500	1875	750	2625	25,875
Income in case of rented IPT outskirts of city	Shuttle services	9000	1875	750	2625	6,375
Income in case of owned IPT outskirts of city	Shuttle services	21,000	Rs 1875	Rs 750	2625	18,375
Income in case of rented IPT within city +school permit	Shuttle services	17,000	Rs 1875	Rs 750	2625	14,375
Income in case of owned IPT within city+ school permit	Shuttle services	Rs 29,000	Rs 1875	Rs 750	2625	26,375

\*average of maintenance cost per month taken

#### h. Association with unions

There is only 1 single trade union registered under the name of Alwar Vahini. The association is sustaining itself by charging Rs 25 per day from the drivers to provide benefits like education, healthcare facilities etc to the drivers. However in real terms the drivers are happy associating with the trade unions as these provide benefits to drivers in terms of medical facilities mainly.

### **i. Other problems**

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1. As per the driver's survey 90 % of the drivers have obtained only primary education or are illiterate. Therefore the computerized driving test becomes a problem for drivers and secondly the nationalized banks takes advantage of the illiteracy and charges higher rates of interest (14%) for loans sanctioned for the four wheelers as against 10% earlier promised.
2. No social benefits are given like training benefits, housing, medical facilities, and education facilities.
3. Competition increases between drivers though the routes and fleet size is fixed by RTO, as the number of autos continues to grow due to political support.
4. Higher maintenance cost for the drivers per month an average of Rs 1875 leads to lowering of revenue earned (Refer Table 2 )

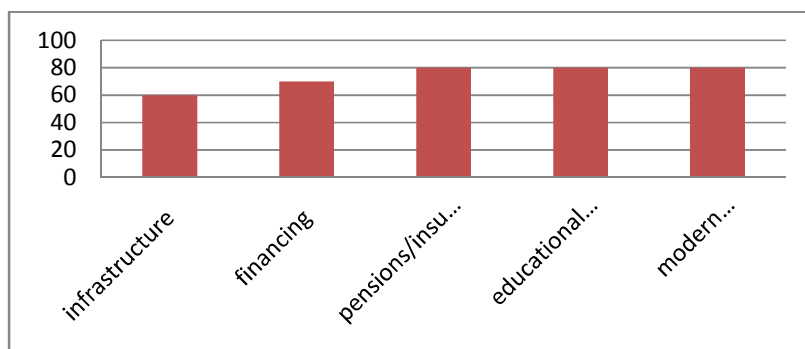
### **j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

#### **Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 60% respondents in Alwar suggested for provision of parking areas and dedicated roads for these four wheelers for improvement of speeds. This percentage is lower compared to other cities because there is already presence of bus shelters that are being used as substitute for these vehicles.



**Figure 44 Suggestions for improvement**

### **Financing**

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out money for providing charges to unions, rent to owners etc which decreases their revenue earnings. Hence a common criteria that both the auto rickshaw drivers and unions (70%) suggested that the financing procedure of IPT should be made easier and loans would be provided at a lower rate from the banks.

### **Pensions/Insurance**

About 80% of auto rickshaw driver feels that insurance should be given insurance for their future security, as the drivers are providing services to general public.

### **Training Programmes:**

About 80% of respondents in Alwar agreed to undergo training and educational training programmes for providing better service to customers.

### **Usage of modern technology**

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then only 80 % of the drivers suggested for such improvement to be added.



#### **k. Summary of findings from drivers survey**

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1. From the survey it is found that the four wheelers that are rented and runs on the outskirts of the city earns Rs 600-Rs 800 per day are the worst sufferers (Refer table 2) as these drivers cannot provide better future to his family because the earning is slightly above the minimum wage level for the state Rs 6270.
2. It is also noted from the survey that the route rationalization and headway fixed by the unions and RTO is not properly done as a result often the drivers do not find passengers and leads to lower income especially in the outskirts of the city.
3. It is also seen from the survey that maintenance cost is higher for these vehicles (average Rs 1875/ month) and therefore the drivers use local parts for replacements often leading to breakdowns in services.
4. Lack of proper infrastructure facilities like parking areas, workshops for repairs etc.
5. Competition increases between drivers though the routes and fleet size is fixed by RTO, as the number of autos continues to grow due to political support.
6. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also the driver often does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 20-25%.But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income Also due to illiteracy among drivers therefore it is said that banks take advantage and make the drivers sign at a higher rate of interest.
7. Since the educational levels are lower therefore computerized driving test are not possible to be given.

8. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.

## Users survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 10 users on the basis of random sampling was carried out, at various locations. Of city, gramin and other routes by selecting various characteristics that they associate with this IPT mode

### a. Age group of users

From the survey it has been observed that above 20 years all age groups of people use the IPT services. About 58 % of the surveyed users belong to the age group 20 to 40 years. Only 25 % belongs to the age group between 40- 50 years. Above the age group of 50, only 10 % uses the service. Therefore the IPT services are mostly used by the working population.

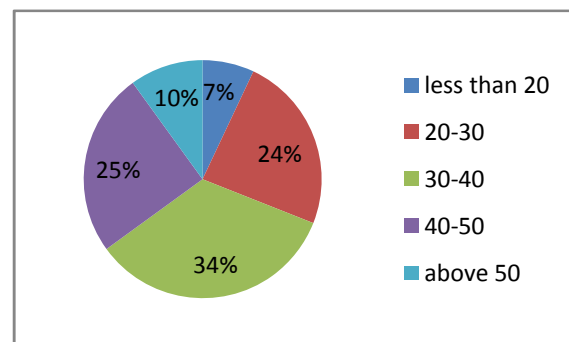


Figure 45 age profile of users

### b. Occupations of users

From the survey it is observed that more than 33 % of the users belong to the private firms. About 10 % of the government uses IPT services, students account for 18% and 12% to housewives. However 16 % of people are working in industries that are within the city of Alwar or are nearby.

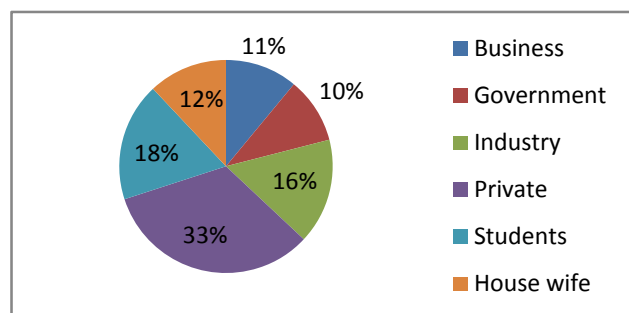


Figure 46 Occupation

### c. Purpose of trip by IPT

It has been observed that 54 % of the trip purposes for which these IPT services are used are for work purpose and 30% for social purpose. Only 16% uses for educational trips.

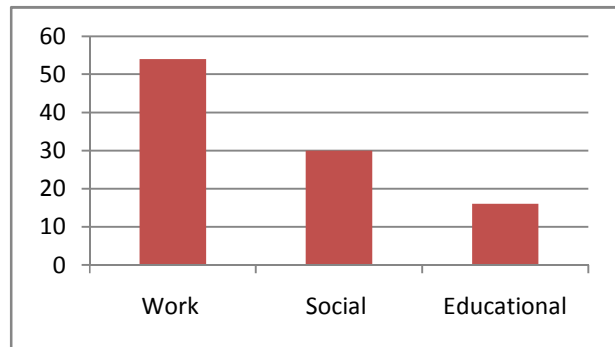
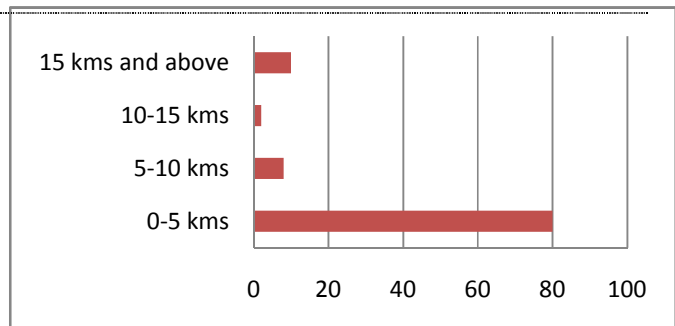


Figure 47 Trip purpose

### d. Average distance travelled by passengers

It has been observed that 88% of users travel by IPT for a small to medium distance trips of not more than 10 kms as the routes are fixed by RTO. However about 10% of the users travel more than



distance of 10 kms and above as these people generally work in industrial areas like Rajgarh, Bayana, Bhiwadi near to Alwar city .

Figure 48 Average distance travelled by users

### e. Expenditure per month

From the survey it has been observed that about 65 % of users spend monthly Rs 500- to Rs 1000 as there is no other alternative in the city for public transport. Only 35 % spend less than Rs 500, these trips are mostly social trips and education trips that are done

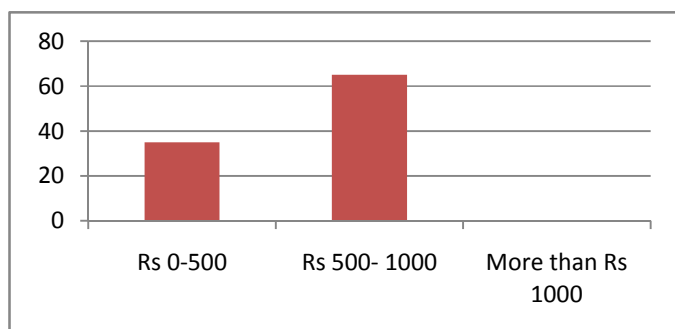


Figure 49 Expenditure per month

occasionally.

#### f. Safety and Security

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It has been stated that 80% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher especially for females in the outskirts of the city.

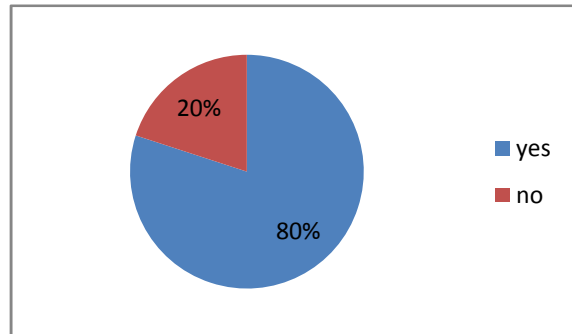


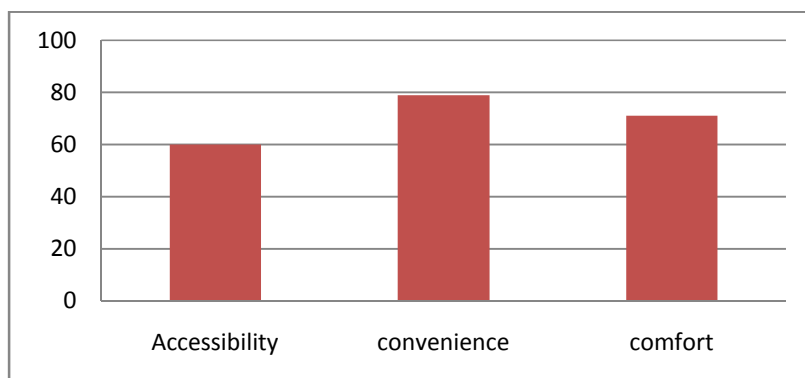
Figure 50 safety and security mechanism in IPT vehicles

#### g. Reasons for usage of IPT other than Public transport

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This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

- 1. Accessibility:** Nearly 60 % respondents found IPT to be more accessible. The main reason being availability of auto rickshaw whenever required at all locations, though night services after 7 pm are not provided. However the other 40% of users claim that it is not accessible because of the fixed routes therefore these IPT do not provide door to door services.
- 2. Convenience:** Another characteristic associated with their preference was convenience. Around 79% respondents find IPT to be more convenient again for the main reason being its easy availability. Also the waiting time for these IPT are generally lower compared to the public transport therefore the overall journey becomes very convenient. The rest 21% of surveyed users believe that it's not convenient service because in order to reach the ultimate destinations the passengers cannot maneuver the routes instead make interchanges at various places.



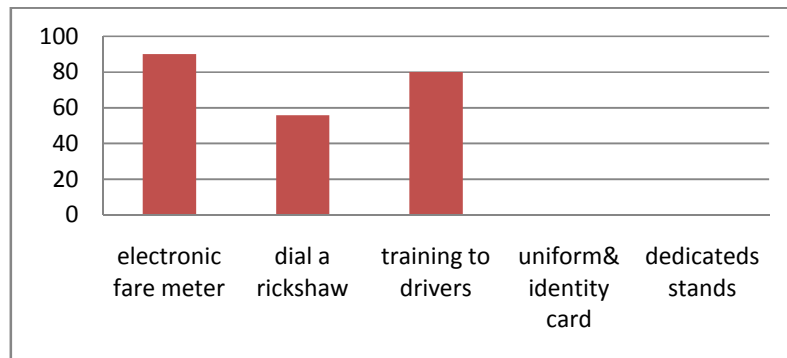
**Figure 51 Reasons for usage of IPT**

3. **Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. 71 % of the respondents using the service in Alwar said that it is comfortable. However 29% complains of dis comfort as more passengers are illegally carried and due to long waiting time at stops in order to get passengers, the users have to wait

#### **h. Other Suggestions for organizing services of IPT**

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1. Usage of modern technology- About 90% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally. The users that travel short distances also has to pay higher fares as compared to long distance travelled commuters.
2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 56% passengers are willing to use the services. The other 44% believes that there will be extra transaction charges associated with the modern technology used, as a result people would not prefer to use the services.



**Figure 52 other suggestions**

3. Training to drivers on road safety and driving skills were also agreed by about 80 % of the users. As the drivers often drive rashly according to passenger's perception.

**i. Summary of findings from Users survey**

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- a. Charging of higher fares for short distances travel by commuters as compared to long distance travel as the fare meters are not fixed by RTO
- b. Carriage of more passengers as compared to the design capacity of the rickshaws, leading to dis comfort.
- c. Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services after evening.
- d. Long waiting time at certain locations in search of passengers leads to dis comfort of commuters
- e. Non availability of IPT services after 7pm is also a major issue for commuters going to railway stations or in case of emergency.

# City Analysis- Indore

## City Profile - Background

Indore is the largest city of the Indian state of Madhya Pradesh. It serves as the headquarters of both Indore district and Indore Division. It is said to be commercial capital of the state as it exerts a significant impact upon commerce, finance, media, art, fashion, research, technology, education, and entertainment. The city is located 190 km west of the state capital of Bhopal with a population of 19.60 lakhs (Census, 2011).

## Transport scenario

Public transport system in the city comprises of organized bus service (120 fleet) operation and metro taxi services(100) operated by Indore City Transport Service Limited(ICTSL)complemented by unorganized para transit system There are also buses that are owned by private operators which are operated on 24 different routes. Their operation is also monitored and controlled by ICTSL.

The total number of registered IPT in the city is 12, 668 including Tata Magic and IPT. (RTO Indore,2011). The modal share for the city is 14.69% by walk, 11.93 by bicycle, 9.13% by IPT, 19.07% by public transport and 45% by private modes (CMP , 2011)

## IPT System

The type of IPT functioning in Indore City is

### **Tata Magic (8 seater capacity) –**

The city authorities in order to scrap the polluting vehicles like the tempos and vikrams have introduced Tata Magic and CNG run IPT. This type of auto rickshaw is the one which operates on a shared basis from one destination to another in the city on a pre-decided route fixed by

unions as these are considered some of the profitable routes in the city. These vehicles are 8 seater and at times during peak hour carries more than 8 passengers.

### **IPT (3 wheelers)-**

This type of auto rickshaw is the commonly found auto rickshaw which operates as personally hired vehicle. It provides connectivity from one destination to another in the city on a pre-decided per km meter based fare system. They are generally used by users as an access or egress mode to the formal PT system or are also used as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another. 3 seater capacity IPT also ply as “shuttles” in some areas accommodating more than 3 passengers to even 6 passengers as an illegal practice,

### **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city. Though aware, of the para transit system prevailing in the city, the authorities are not stringent about the violations and the number of illegal vehicles that are running in the city.

### **Routes and fares**

The routes of Para transit vehicles are not fixed by the RTO. At present the Tata Magic routes are fixed by the unions and these routes are fixed in such a way that these operate on higher profitable routes. The unions enjoy power of fixing these routes as these are under political party's influence of the areas. The IPT routes are also not fixed and these prefer to commute passengers from specific areas, which provide them steady income.

The fare structure is fixed by the trade unions for Tata Magic it ranges between Rs 4 to Rs 8. However the three wheelers fares are fixed by the RTO. The autos that are run on petrol have a fixed fare of Rs 14 for the first kilometer and then increases with every 1 km by Rs 9. For autos that run on CNG/LPG the first kilometers is Rs 12 and with every increase in kilometer Rs 8 is charged.



## **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.750 and for replacement of old with new vehicles is Rs 1000 along with the following documents:

- Driving licence
- Residence proof
- Insurance certificate
- Dully filled in application form to the Regional Transport Officer.

The time taken for processing is less than 15 days from the date of application. The permit is renewed after every 5 years at a payment of Rs 750. Penalties are charged according to the days of delay in the renewal process

## **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and Madhya Pradesh State Motor Vehicles Rules.

## **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. Auto rickshaw stands have been created by the Municipal Corporation at 346 locations in the city along with their fixed capacities. Also it is seen that few of the stands are overlapping with the BRTS routes of the city. But due to lack of proper facilities like overcrowding in these autos people do not prefer to use these facilities. Often these locations of stands are blocked by encroachment. Therefore the IPT still queue up seeking potential passengers at critical junctions, thus contributing to congestion levels. Also no workshops or repairing shops are provided for repair of the vehicles.

## **Vehicle characteristics**

In order to remove the polluting and noisy vikrams and tempos, the city authorities launched Tata Magic in the city. The Tata Magic and IPT are run on CNG. At present about 76 % of the IPT and Tata Magic are CNG run whereas only 26 % of IPT on petrol.

## Sample size for Auto rickshaw drivers and users survey

Surveys were carried out for drivers and users of IPT in Indore city. 100 surveys for drivers and users were conducted through random sampling method at some of the busiest routes fixed for the Tata magic and the locations of normal autos and also few non busy routes which mainly confined to normal autos. Some of the survey locations are Aerodrome, Mahesh nagar, Rajwada, Mahalaxmi Nagar, Keshav Nagar, Rajendra nagar, Devnagar

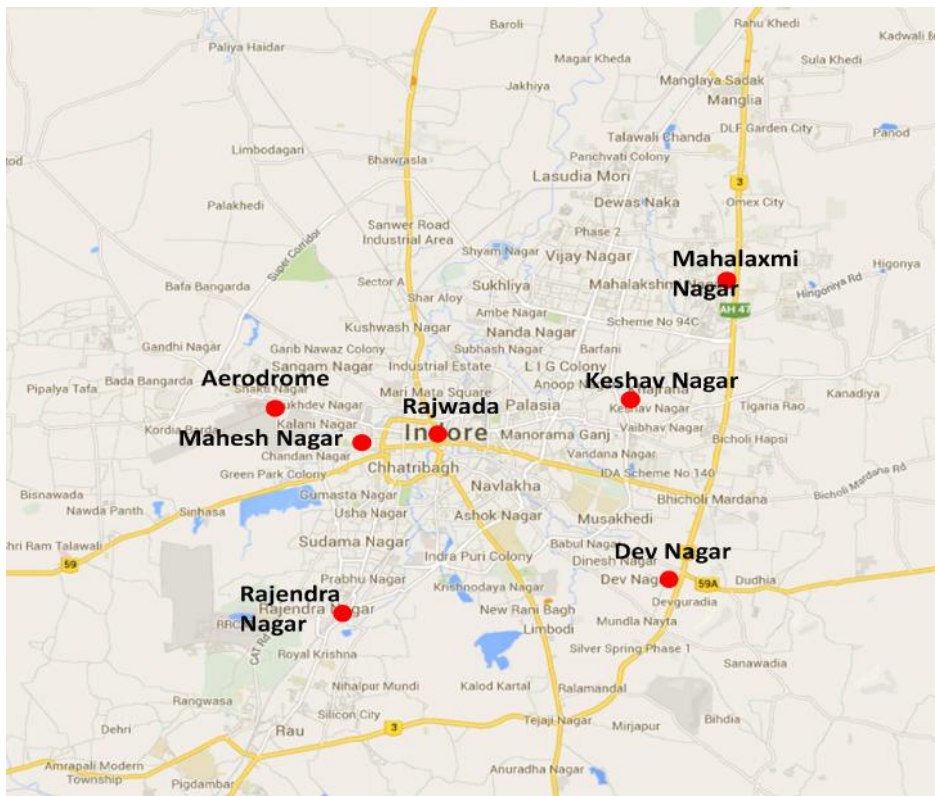


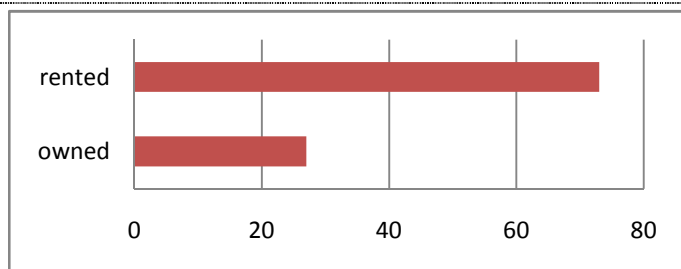
Figure 53 Survey location

## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

**a. Ownership of Vehicles**

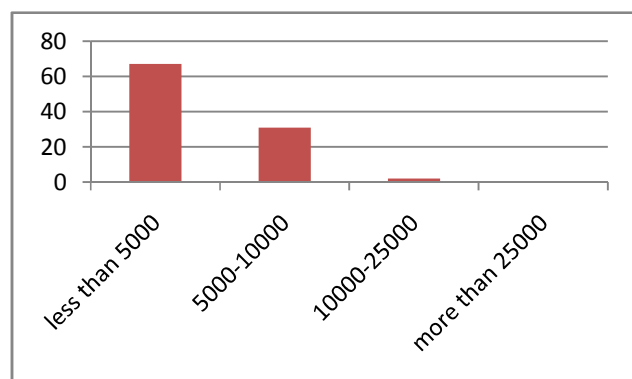
About 73% of the drivers surveyed at various locations of the city stated that they have rented their three wheeler and tata magic they drive. Owned is 27% only. The main reason being that they have not enough money to purchase an auto rickshaw and purchasing an auto rickshaw through a loan from the bank is a lengthy process due to much of documentation required (as mentioned in previous chapters). It is also observed that majority of the owners own about 1 to 5 IPT. The rent paid by the Tata magic drivers are Rs 750- Rs 800 per day whereas the drivers of IPT pay 250- 300 per day.



**Figure 54 Ownership of vehicles**

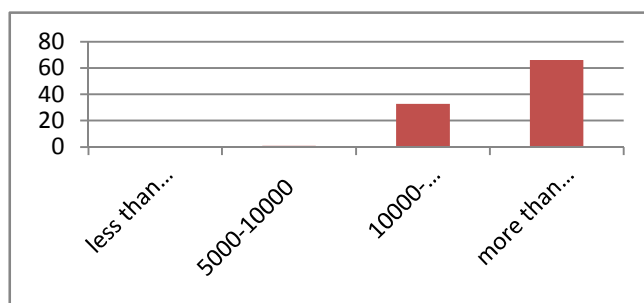
**b. Revenue earned per month**

67 % the drivers of IPT stated that the average revenue collected per month is less than Rs 5000. 31% stated that revenue varies between Rs 5000 to Rs 10, 000 and only 2 % revenue is between Rs 10,000 to Rs 25,000.



**Figure 55 Revenue Earned / month by auto**

However the revenue earned by the Tata Magic per month is Rs 25,000 and more for 66% of drivers and 31% stated that their revenue is between Rs 10,000 to Rs 25,000 and only 1% is between Rs 5000 to Rs 10,000.



**Figure 56 revenue earned /month by Tata Magic**

The difference in income is because the Tata magic generally runs on profitable routes where it is easy to find passengers as well as these get political support therefore the income earning is higher. In case of three wheelers the income is lower because the fares are fixed at higher rate as compared to Tata magic and secondly less number of people can be carried at per trip. Other than fare box revenue no other permissions for revenue generation like advertisements, participation in rallies, schools etc are not given by the government. Comparative table showing earning of rented and owned four wheelers are given below:

**Table 1 Revenue earned per month**

Descriptions		Earning per day	Average earning per month	Rent/day	Total earning per month
Income in case of rented IPT (general routes)	Shuttle services	Rs 166.66	Rs 5,000	Rs 275	-Rs 3250
Income in case of owned IPT (general routes)	Shuttle services	Rs 166.66	Rs 5,000	-	Rs 5,000
Income in case of rented IPT on profitable routes	Shuttle services	Rs 250	Rs 7500	Rs275	-Rs 750
Income in case of owned IPT on profitable routes	Shuttle services	Rs 250	Rs 7500	-	Rs 7,500
Income in case of rented Tata Magic( general routes)	Shuttle services	Rs 583.33	Rs 17,500	Rs 775	c. -Rs 5750
Income in case of owned Tata Magic	Shuttle services	Rs 583.33	Rs 17,500	-	Rs 17,500

<b>(general routes)</b>					
<b>Income in case of rented Tata Magic on profitable routes</b>	<b>Shuttle services</b>	Rs833.33	Rs 25,000	Rs 775	Rs 1,750
<b>Income in case of owned Tata Magic on profitable routes</b>	<b>Shuttle services</b>	Rs833.33	Rs 25,000	-	Rs 25,000

**c. Average length travelled by auto per day**

About 67 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms and only 33 % stated that the average length travelled to be between 100-150 kms. These long distance travel trips cater to the southern periphery of the city which usually caters to laborers who travel from rural areas to urban areas for work.

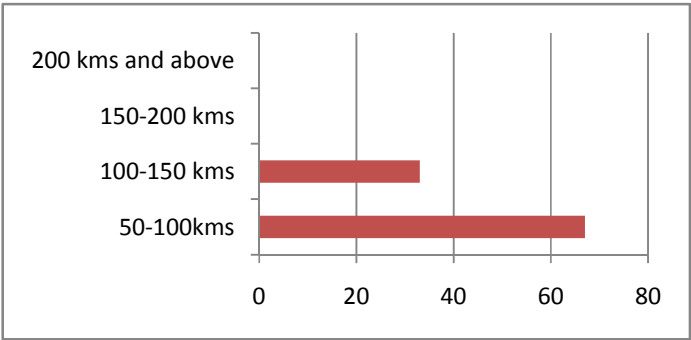


Figure 57 Average length travelled /auto/day

**d. Passengers travelled per day per auto**

It is stated that about 45% of drivers carries above 120 passengers per auto per day, as these are usually the Tata Magic that run within the city centre and carries more passengers. 28 % of three wheeler autos carries

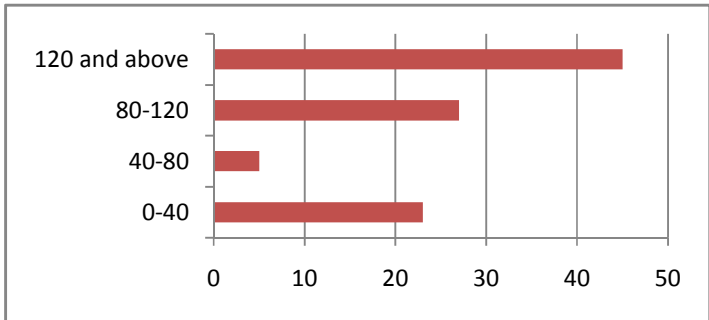


Figure 58 Passengers travelled per day per auto

less than 80 passengers per day, due to lack of passengers.

#### e. Funding Provisions to operators

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents (refer to previous chapter) required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges

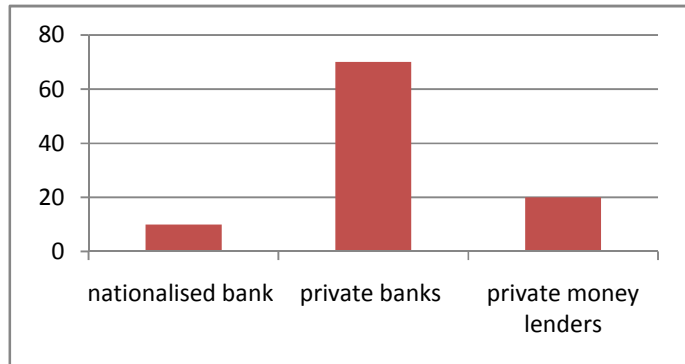
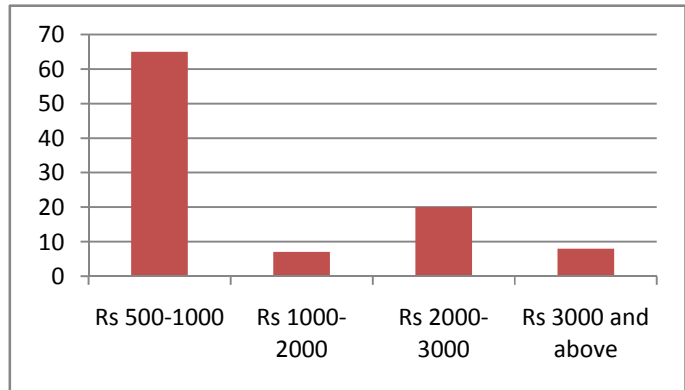


Figure 59 Financing IPT

higher interest of 20 -25% as compared to nationalised banks which charge from 10.5- 12.5%. Some of the common financiers are State Bank of India, Bajaj finance and Kotak Mahindra Finance etc. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 70% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks even though it being a legal procedure. About 20 % can get easy loans from the private money lenders as these are associated with the political parties support.

**f. Maintenance cost of vehicles.**

About 72 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 500-2000. The average maintenance cost per month is Rs 1250. 28% stated that the cost of maintenance of the vehicles per month is from Rs 2000-Rs 3000 (average Rs 2500/month). The reason

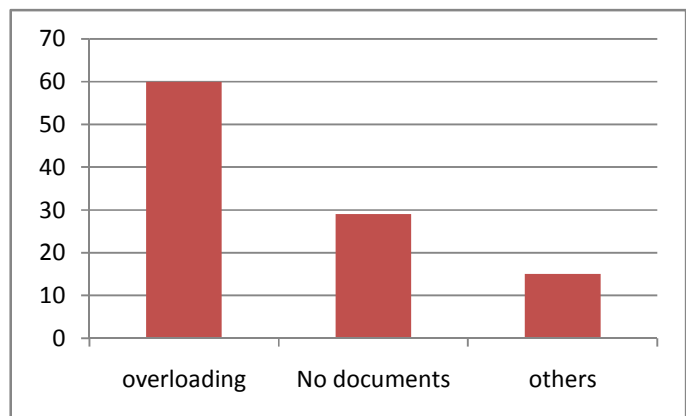


**Figure 60 Maintenance cost of vehicles/month**

for increase in maintenance cost is due to expensive technology used in the Tata magic compared to normal three wheeler auto.

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for overloading of passengers, without permit or documents etc. About 60% of the autos are fined for overloading. 29% is fined for no documents and 15% for other reasons. However the traffic penalties are often converted into sources of bribe for



**Figure 61 Reasons for bribes/penalties**

the city traffic officials. The illegal or overloaded vehicles are fined Rs 30 per week for keeping their operations continued. The total income and expenditure are given below:

Table 2 Total income and expenditure of auto drivers

Descriptions		Total earning per month (In Rs)	Maintenance cost/month*(In Rs)	Payment to police /week (Rs)	Total expenditure /month (in Rs)	Total revenue/month (in Rs)
Income in case of rented IPT (general routes)	Shuttle services	- 3250	1875	120	1995	-5245
Income in case of owned IPT (general routes)	Shuttle services	5,000	1875	120	1995	3005
Income in case of rented IPT (profitable routes)	Shuttle services	- 750	1875	120	1995	-2745
Income in case of owned IPT (profitable routes)	Shuttle services	7,500	1875	120	1995	5505
Income in case of rented Tata Magic (general routes)	Shuttle services	-5750	1875	120	1995	-7745
Income in case of owned Tata Magic (general routes)	Shuttle services	17,500	1875	120	1995	15505
Income in case of rented Tata Magic (profitable routes)	Shuttle services	1,750	1875	120	1995	-245
Income in case of owned Tata Magic (profitable routes)	Shuttle services	25,000	1875	120	1995	23005

\*average of maintenance cost per month taken

#### h. Association with unions

There is 5 unions registered under which there are 4 unions dedicated to the three wheeler IPT and one for the Tata Magic. The unions provide benefits in official matters like renewal of permits, getting loans sanctioned for new vehicles and act as mediators in case of disputes. The unions also provide legal support to its members. However in real terms the drivers are happy associating with the trade unions as these provide benefits to drivers.



### **i. Other problems**

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1. As per the driver's survey 64 % of the drivers have obtained only primary education and only 2% are graduate and above and 2% are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, and education facilities.
3. Competition increases between drivers though the routes and fleet size is fixed by RTO, as the number of autos continues to grow due to political support.
4. Higher maintenance cost for the drivers per month for Tata Magic drivers on an average of Rs 1995 leads to lowering of revenue earned (Refer Table 2 )

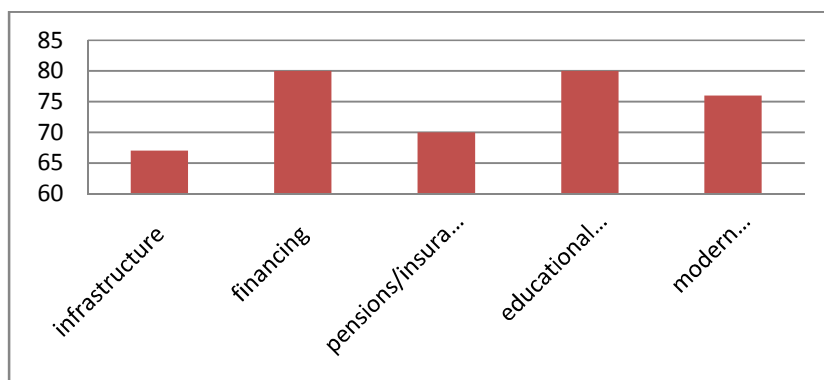
### **j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

#### **Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 67% respondents in Indore suggested for provision of stands with proper enforcement by Traffic police. This percentage is lower compared to other cities because there is already presence of designated stands in the city but due to lack of enforcement these stands are not utilized. Also there are often encroachments found on these areas so autos queue on roads.



**Figure 62 Suggestions for improvement**

### **Financing**

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out money for providing charges to traffic police, rent to owners etc which decreases their revenue earnings. Hence a common criteria that both the auto rickshaw drivers and unions (80%) suggested that the financing procedure of IPT should be made easier and loans would be provided at a lower rate from the banks.

### **Pensions/Insurance**

About 70% of auto rickshaw driver feels that insurance should be given insurance for their future security, as the drivers are providing services to general public.

### **Training Programmes:**

About 80% of respondents in Indore agreed to undergo training and educational training programmes for providing better service to customers.

### **Usage of modern technology**

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then only 76 % of the drivers suggested for such improvement to be added.

#### **k. Summary of findings from drivers survey**

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1. From the survey it is found that the three wheelers IPT are earning is even lower than the minimum wages rate Rs 3870 for the state. Also the rented Tata magic earning is lower than the minimum wage rate (Refer table 2).Therefore the drivers cannot provide better future to his family.
2. It is also noted from the survey that the route rationalization is not proper as most of the drivers ply only on profitable routes. Though there is overlap of routes of BRT and IPT but due to overcrowding the passengers from BRT does not use these IPT.
3. It is also seen from the survey that maintenance cost is higher for Tata Magic (average Rs 2250/ month) and therefore the earning of drivers are further lowered.
4. Lack of proper infrastructure facilities like parking areas, rest rooms, workshops for repairs etc.
5. Lack of enforcement by Traffic police as the auto rickshaw stands are always encroached and therefore the autos stand on the road and causes congestion.
6. Competition increases between drivers though the routes and fleet size is fixed by RTO, as the number of autos and Tata Magic especially continues to grow due to political support.
7. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also the driver often does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 20-25%.But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income

Also due to illiteracy among drivers therefore it is said that banks take advantage and make the drivers sign at a higher rate of interest.

8. Since the educational levels are lower therefore computerized driving test are not possible to be given and is leading to poor safety within operations..
9. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.

### Users survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 10 users on the basis of random sampling was carried out, at various locations. of city, gramin and other routes by selecting various characteristics that they associate with this IPT mode

#### a. Age group of users

From the survey it has been observed that all age groups of people use the IPT services. About 57 % of the surveyed users belong to the age group 30 to 50 years. 35 % belongs to the age group up to 30 years. Above the age group of 50, only 8% uses the service. Therefore the IPT services are mostly used by the working population.

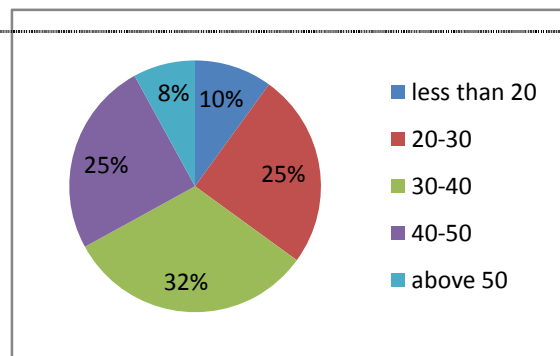


Figure 63 age profile of users

#### b. Occupations of users

From the survey it is observed that more than 43 % of the users belong to the private firms. About 10 % of the users are government employed, students account for 18% and 12% to housewives.

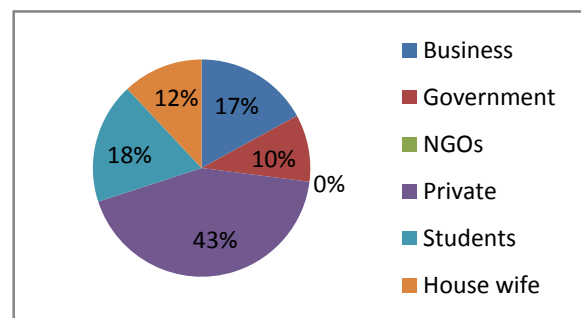


Figure 64 Occupation

However 17 % of people are having their own business in the city.

### c. Purpose of trip by IPT

It has been observed that 66 % of the trip purposes for which these IPT services are used are for work purpose and 25% for social purpose. Only 9 % uses for educational trips.

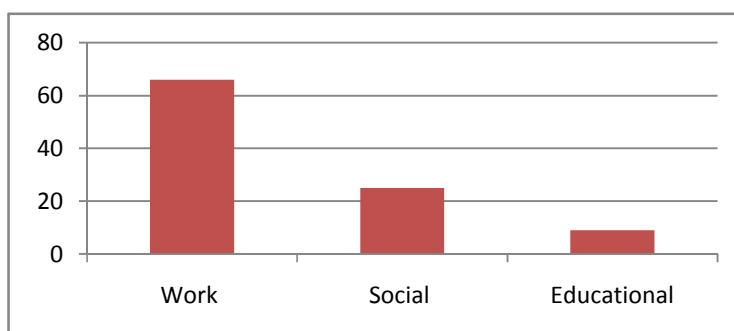


Figure 65 Trip purpose

### d. Average distance travelled by passengers

It has been observed that 75 % of users travel by IPT up to 5 kms distance and mostly these are three wheeler IPT. However about 25 % of the users travel more than distance of 5 kms and above and these long distances are mainly catered by Tata Magic as they the fares are lower than normal IPT, so the public prefer it.

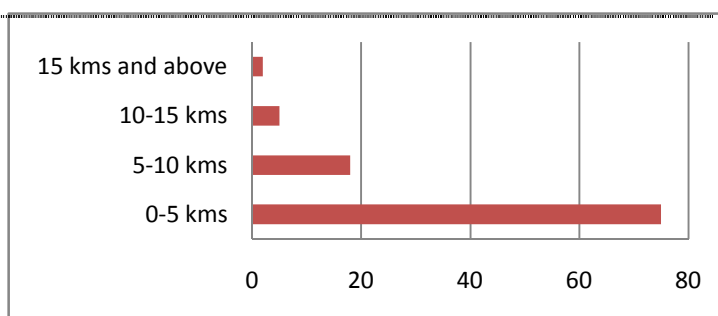


Figure 66 Average distance travelled by users

### e. Expenditure per month

From the survey it has been observed that about 65 % of users spend monthly up to Rs 500 as mostly the three wheeler IPT are preferred for short distance travel and 28 % spend Rs 500 to Rs 1000. However only 7% spend more than Rs 1000 as long distance travel.

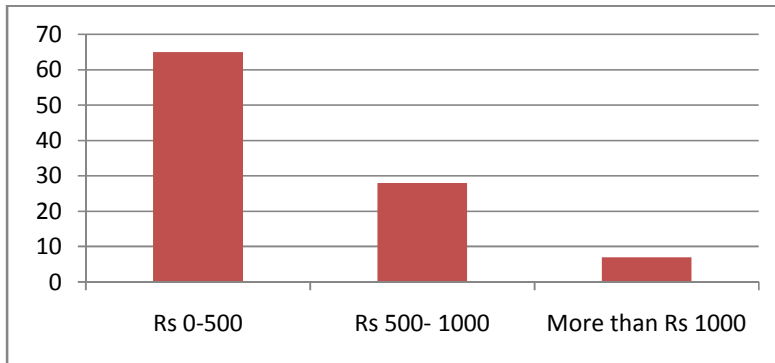


Figure 67 Expenditure per month

#### f. Safety and Security

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It has been stated that 88% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher especially for females and elderly.

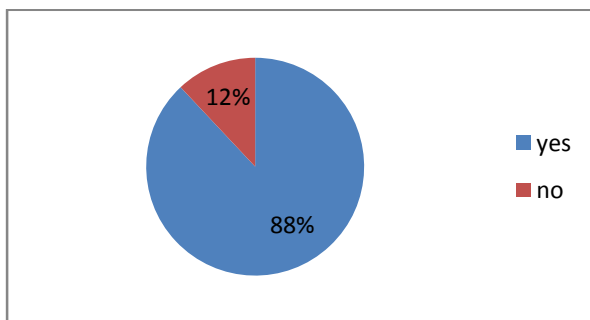


Figure 68 safety and security mechanism in IPT vehicles

#### g. Reasons for usage of IPT other than Public transport

---

1. This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.
2. **Accessibility:** Nearly 70 % respondents found IPT to be more accessible. The main reason being availability of auto rickshaw whenever required at all locations, though night services

are not provided. However the other 30% of users claim that it is not accessible because of the fixed routes therefore these IPT do not provide door to door services.

- 3. Convenience:** Another characteristic associated with their preference was convenience. Around 74% respondents find IPT to be more convenient again for the main reason being its easy availability. Also the waiting time for these IPT are generally lower compared to the public transport therefore the overall journey becomes very convenient.

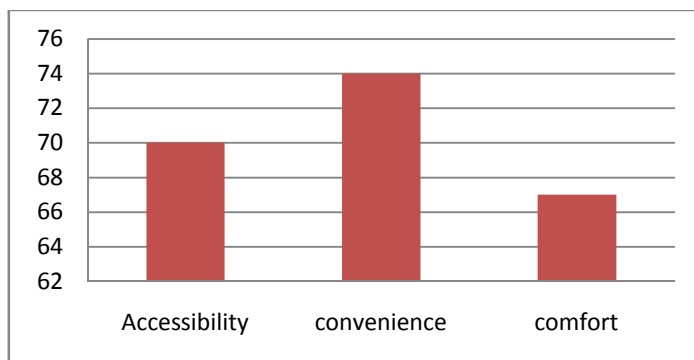


Figure 69 Reasons for usage of IPT

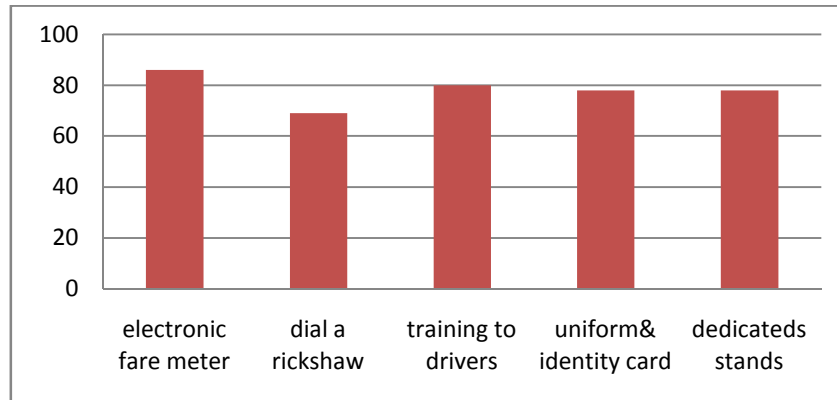
- 4. Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. 67 % of the respondents using the service in Indore said that it is comfortable. However 33 % complains of dis comfort as more passengers are illegally carried and due to long waiting time at stops in order to get passengers, the users have to wait

#### **h. Other Suggestions for organizing services of IPT**

---

1. Usage of modern technology- Though fares are fixed but often the fare is bargained by the users and the operator. Therefore about 86 % of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.

- When users were made aware of the usage of old panic button, dial a rickshaw services then about 69 % passengers are willing to use the services. The other 31% believes that there will be extra transaction charges associated with the modern technology used, as a result people would not prefer to use the services.



**Figure 70 other suggestions**

- Training to drivers on road safety and driving skills were also agreed by about 80 % of the users. As the drivers often drive rashly according to passenger's perception.
- 78% users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion from roads.
- About 78% of users agreed that uniform dress code and identity card to all drivers make it safe for users using the services as lot of crime takes place in the city

#### **i. Summary of findings from Users survey**

---

- Since the fares are not regulated by RTO and are fixed by unions therefore the drivers charge illegally. Therefore often higher rates are charged for even shorter distance of travel.
- Carriage of more passengers as compared to the design capacity of the rickshaws, leading to dis comfort.



- c. Safety and security mechanisms are missing therefore the users especially females and elderly do not feel safe to use the services after evening.
- d. Long waiting time at certain locations in search of passengers leads to discomfort of commuters
- e. Non availability of IPT services at night is also a major issue for commuters going to railway stations or in case of emergency.

# City Analysis -Ranchi

## City Profile - Background

Ranchi is the capital of the Indian state of Jharkhand. As per latest 2011 India census, Ranchi city has a population of 1,073,440, making it the 37th largest urban city in India and third largest city in Jharkhand after Jamshedpur and Dhanbad. Recently employment opportunities and opening of numerous regional and state level offices, banks, and FMCG companies, the city witnessed a rapid influx of employment seeking migrants. As per a study done by ASSOCHAM in late 2010, Ranchi was the highest employment generating Tier-III city in India with a share of 16.8%, followed by Mangalore and Mysore.

## Transport scenario

The city's public transport constitute of auto rickshaw and cycle rickshaw. A city bus service under JNNURM was started in 2010 to meet the demands of public transport. There are a total of 150 city buses operating in Ranchi. The Jharkhand Tourism Development Corporation (JTDC) was given the responsibility of running the buses in Ranchi.

There are around 6,000 auto- rickshaws in Ranchi and only around 2,300 had permits. The Jharkhand High Court in May 2012 directed the state government to ban the plying of auto-rickshaws more than 10 years old on the roads of state capital Ranchi, to meet with the pollution standards. Therefore the number of fleet has come down .Even though few are operating illegally.(RTO,2013).

## IPT System

The type of IPT functioning in Ranchi City is

### **Vikram (6-8 seater capacity) –**

This type of auto rickshaw is the commonly named as tempos or vikrams in the city and operates on a shared basis and sometimes on personal hired basis. It provides connectivity from one destination to another in the city on specific routes and fares fixed by unions. These are used as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another. These IPT ply in some areas accommodating more than 8 passengers to even 10 and 12 passengers as an illegal practice, especially during peak hour.

### **IPT (3 wheelers)-**

This type of auto rickshaw is the commonly found auto rickshaw which operates on shared and personally hired basis. It provides connectivity from one destination to another mostly from railway station and airports. These are mostly 24 hours services and are used as pre paid taxis services in the city. The routes and fares are not fixed by the RTO. These IPT run as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another. 3 seater capacity IPT also ply more than 3 passengers to even 6 passengers as an illegal practice during peak hours.

## **Regulatory bodies**

The District Transport office (DTO) and City traffic police are the main authorities looking after the regulatory issues in the city. Though aware, of the para transit system prevailing in the city, the authorities are not stringent about the violations and the number of illegal vehicles that are running in the city without permits even.

## **Routes and fares**

The routes and the fares of Para transit vehicles are not fixed by the DTO. These are generally fixed by the Auto unions. At times the autos maneuver their own routes according to peak demand of passengers. . The routes are mostly concentrated according to the profitability and availability of passengers. Fares are fixed by unions at various locations but still the drivers

charge illegally as there is absence of metered fares in the city. Revision of fares has been done for along time.

### **Issue of Permits and its renewal process**

The permit for IPT is issued by the District Transport Office (DTO) at a payment of Rs.503 along with the following documents:

- Age proof
- Insurance certificate
- Dully filled in application form to the Regional Transport Officer.

The time taken for processing is less than 15 days from the date of application. The permit is renewed after every 5 years at a payment of Rs 500. No penalties are charged according to the days of delay in the renewal process

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and Jharkhand Motor Vehicles Rule 2002.

### **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. Auto rickshaw stands have been not been demarcated. The IPT make their own stand according to availability of spaces. Also due to encroachments there is no space on roads where the stands have been created therefore the IPT still queue up seeking potential passengers at critical junctions, thus contributing to congestion levels. Also no workshops or repairing shops are provided for repair of the vehicles.

### **Vehicle characteristics**

At present nearly all the IPT are 2 stroke diesel run except few that are petrol as there is low maintenance cost associated with it Rs 750 on average per month. However due to recent directives by the High Court of the city new green autos i.e CNG autos and battery operated rickshaws will be introduced shortly.

## Sample size for Auto rickshaw drivers and users survey

Surveys were carried out for drivers and users of IPT in Indore city. 60 surveys for drivers and users were conducted through random sampling method at some of the busiest routes fixed for the IPT and the tempos. Some of the survey locations are Krishna nagar colony, Ranchi University, Lower Bazar, Railway station, Nizam Nagar.

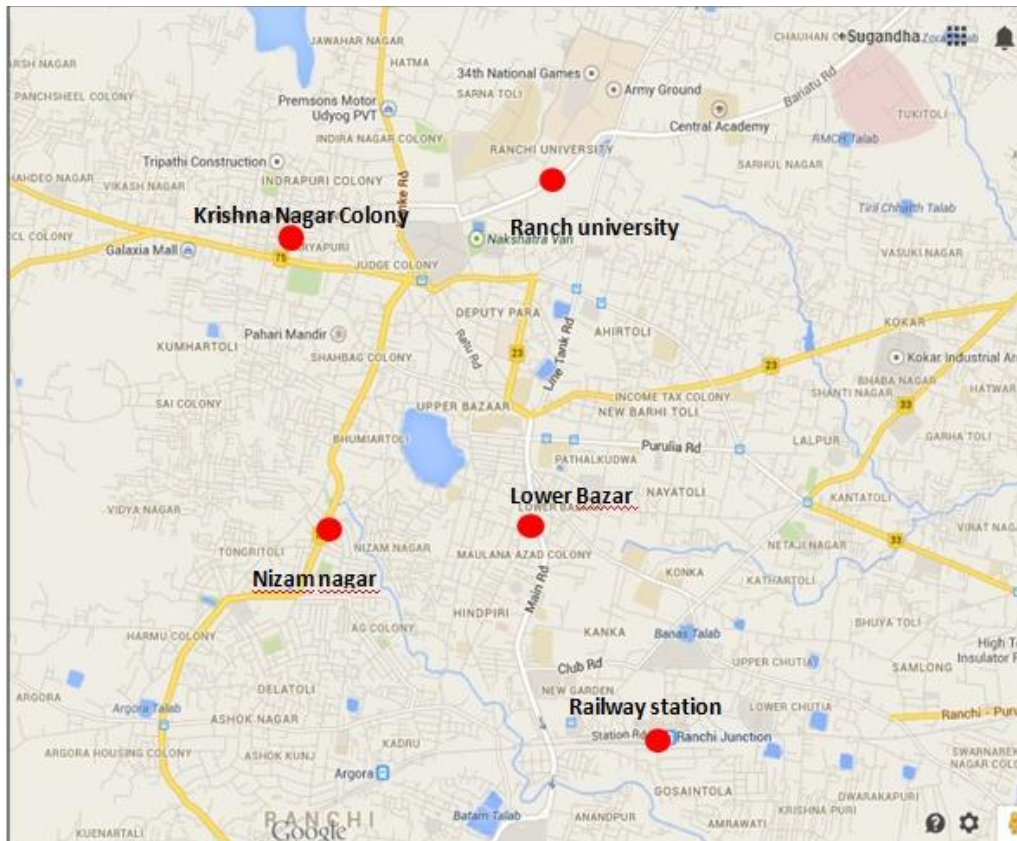


Figure 71 Survey location

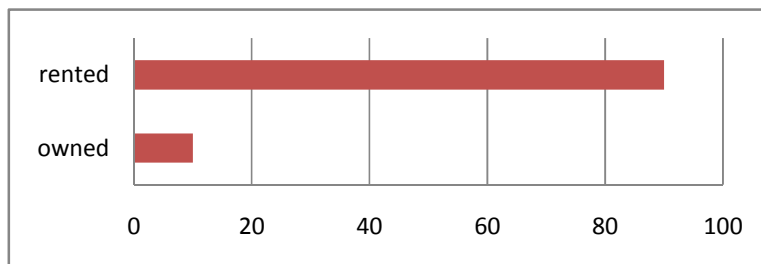
## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

### a. Ownership of Vehicles

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About 90% of the drivers surveyed at various locations of the city stated that they have rented the three wheeler they drive. Owned is 10 % only. The



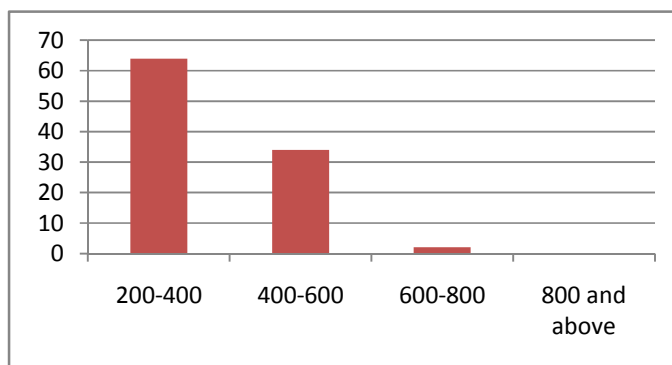
The main reason being that they have not enough money to purchase an

**Figure 72 Ownership of vehicles**

auto rickshaw and purchasing an auto rickshaw through a loan from the bank is a lengthy process due to much of documentation required (as mentioned in previous chapters). It is also observed that majority of the owners own about 1 to 5 IPT in case of three wheelers and 5- 10 in case of tempos. The rent paid by operators to the owners approximately is Rs 250 per day.

**b. Revenue earned per day**

64 % the drivers of IPT stated that the average revenue collected per day is between Rs 200-400. The average revenue per month is Rs 9000. 34 % stated that revenue varies between Rs 400 to Rs 600(average revenue per month is Rs 15,000) and only 2 % revenue is



**Figure 73 Revenue Earned / month by auto**

between Rs 600 to 800(average per month is Rs 21,000) . The earning is higher generally found in case of tempos and vikrams and those IPT (three wheelers that run from the railway stations and airports as there is always supply of passengers and carrying of illegal passengers.

Other than fare box revenue no other permissions for revenue generation like advertisements, participation in rallies, schools etc are not given by the government. Comparative table showing earning of rented and owned four wheelers are given below:

Table 1 Revenue earned per month

Descriptions		Earning per day	Average earning per month	Rent/day	Total earning per month
Income in case of rented IPT	Shuttle services	Rs 200-Rs 400	Rs 9,000	Rs 250	Rs 1,500
Income in case of owned IPT	Shuttle services	Rs 200-Rs 400	Rs 9,000	-	Rs 9,000
Income in case of rented tempos	Shuttle services	Rs 400-Rs 600	Rs 15,00	Rs 250	Rs 7, 500
Income in case of owned tempos	Shuttle services	Rs 400-Rs 600	Rs 15, 000	-	Rs 15,000
Income in case of rented tempos + 3 wheelers( railway station & airport services)	Shuttle services	Rs 600-Rs 800	Rs 21,000	Rs 250	Rs 13,500
Income in case of owned Tempos+ + 3 wheeler(railway station & airport services)	Shuttle services	Rs 600-Rs 800	Rs 21,000	-	Rs 21,000

**c. Average length travelled by auto per day**

About 76 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms and only 24 % stated that the average length travelled to be between 100-150 kms. These long distance travel trips cater to industrial area routes travelling more into the periphery and rural areas around the

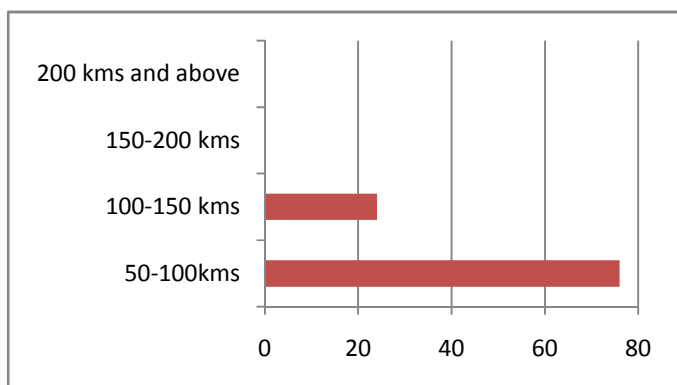
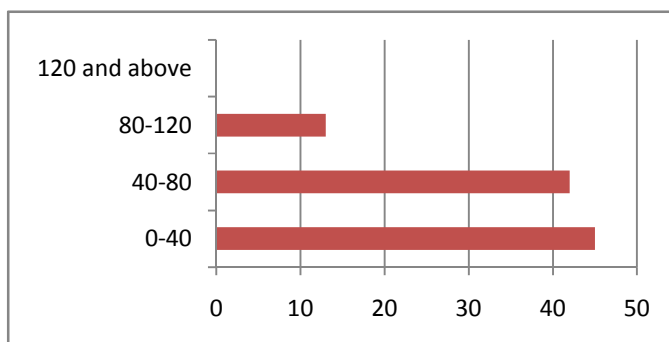


Figure 74 Average length travelled /auto/day

city, as areas around Ranchi is important for its mineral deposit industry.

#### d. Passengers travelled per day per auto

It is stated that about 45% of drivers carries less than 40 passengers per auto per day, as these are usually the small three wheeler IPT that are run on personal or shared basis and their capacity is for carrying people is also



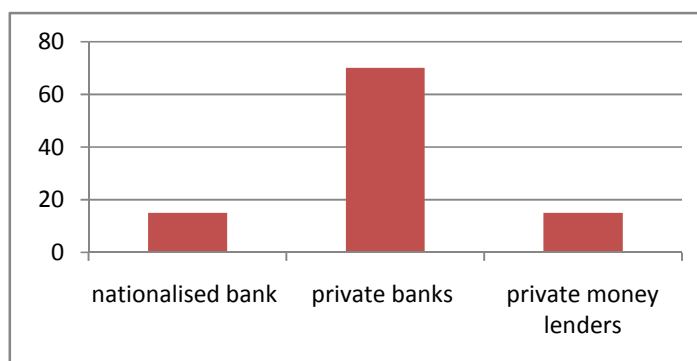
lower. However 42% carries 40 to 80 passengers and only 13 % carries

Figure 75 Passengers travelled per day per auto

above 80 passengers .These routes are generally the rural routes and are overloaded with passengers.

#### e. Funding Provisions to operators

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents (refer to previous chapter) required by the banks to



finance the loan. Hence the driver feels it easy to resort to a private

Figure 76 Financing IPT

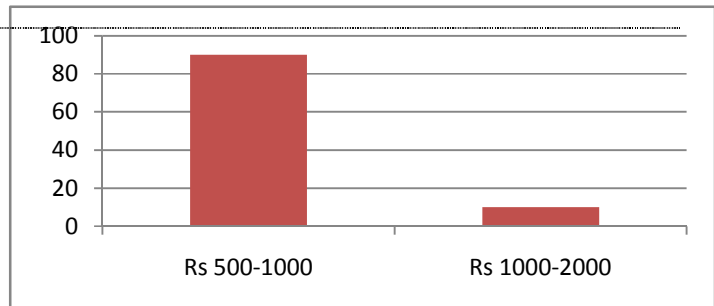
financer even though the financer charges higher interest of 20 -25% as compared to nationalised banks which charge from 10.5- 12.5%. Some of the common financiers are State Bank of India, Allahabad Bank, Bajaj finance and Kotak Mahindra Finance etc. The only reason which tempts driver to go to a private financer is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 70% of the auto rickshaw owner drivers prefer financing through a private financer rather than approaching banks even though it being a legal procedure. About 15 % get loans



from the private money lenders as these are associated with the political parties support and only 15% by nationalized banks.

**f. Maintenance cost**

About 90 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 500-1000. The average maintenance cost per month is Rs 750. Only 10 % stated that the cost of maintenance of the vehicles per month is from Rs 1,000-Rs 2000

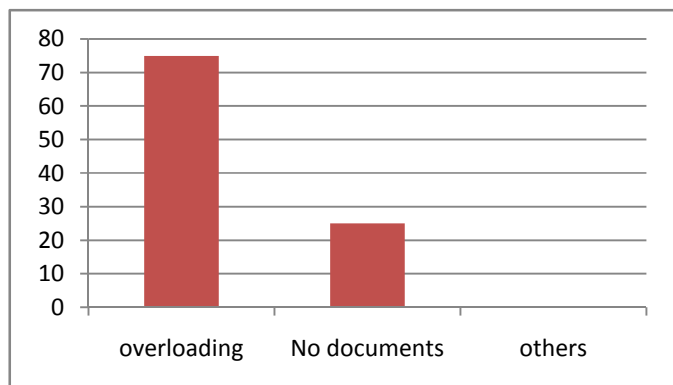


**Figure 77 Maintenance cost /month**

(average Rs 1500/month). The reason for lower maintenance cost is because 2 stroke diesel engines are much cheaper to repair compared to petrol fuel engines.

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for overloading of passengers, without permit or documents etc. About 75% of the autos are fined for overloading. 25 % is fined for no documents. However the traffic penalties are often converted into sources of bribe for the city traffic officials.



**Figure 78 Reasons for bribes/penalties**

The illegal or overloaded vehicles are fined Rs 20 per week for keeping their operations continued.

The total income and expenditure are given below:

Table 2 Total income and expenditure of auto drivers

Descriptions		Total earning per month (In Rs)	Maintenance cost/month*(In Rs)	Payment to police /week (Rs)	Total expenditure /month (in Rs)	Total revenue/month (in Rs)
Income in case of rented IPT	Shuttle services	1,500	1,125	80	1,205	295
Income in case of owned IPT	Shuttle services	9,000	1,125	80	1,205	7,795
Income in case of rented tempos	Shuttle services	7,500	1,125	80	1,205	6,295
Income in case of owned tempos	Shuttle services	15,000	1,125	80	1,205	13,795
Income in case of rented tempos + 3 wheelers( railway station & airport services)	Shuttle services	13,500	1,125	80	1,205	12,295
Income in case of owned Tempos + 3 wheelers( railway station & airport services)	Shuttle services	21,000	1,125	80	1,205	19,795

\*average of maintenance cost per month taken

#### h. Association with unions

There is presence of registered unions for the three wheeler IPT and tempos. The association is sustaining itself by providing benefits like educational, health care facilities etc. However in

real terms the drivers are happy associating with the trade unions as these provide benefits to drivers.

#### **i. Other problems**

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1. As per the driver's survey 74 % of the drivers have obtained only primary education, 24 % are secondary educated and 2% are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, and education facilities.
3. Competition increases between drivers in various routes as fleet size keeps increasing as no residents proof is asked by the RTO while issuing permits to the drivers therefore many migrants from the different neighboring states have come to earn their living.

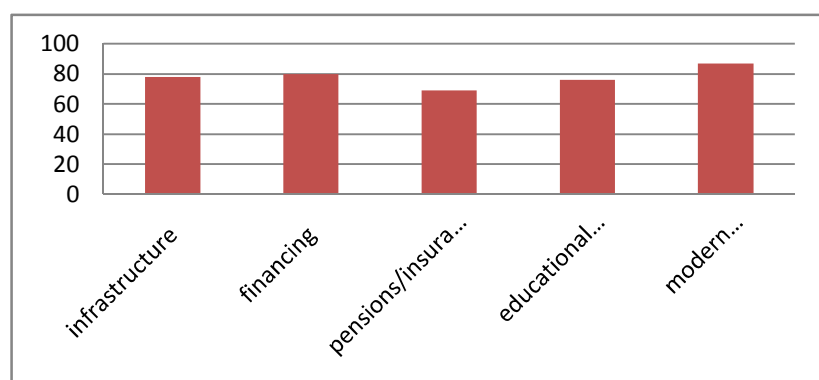
#### **j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

#### **Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a



**Figure 79 Suggestions for improvement**

rickshaw service) would improve their operations. 78% respondents in Ranchi suggested for

provision of stands and parking areas for IPT, which in turn would reduce hassles of the traffic police on daily basis.

### **Financing**

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out money for providing charges to traffic police, rent to owners etc which decreases their revenue earnings. Hence a common criteria that both the auto rickshaw drivers and unions (80%) suggested that the financing procedure of IPT should be made easier and loans would be provided at a lower rate from the banks.

### **Pensions/Insurance**

About 69 % of auto rickshaw driver feels that insurance should be given insurance for their future security, as the drivers are providing services to general public.

### **Training Programmes:**

About 76 % of respondents in Indore agreed to undergo training and educational training programmes for providing better service to customers.

### **Usage of modern technology**

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then only 87 % of the drivers suggested for such improvement to be added.

### **j. Summary of findings from drivers survey**

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1. From the survey it is found that the three wheelers rented IPT are earning is even lower than the minimum wages rate Rs 4,890 for the state, when compared to the tempos that run overloaded especially during peak hours (Refer table 2).Therefore the drivers cannot provide better future to his family.

2. It is also noted from the survey that the route rationalization is not proper as most of the drivers ply only on profitable routes especially close to the city centre or near railway stations or airports.
3. It is also seen from the survey that maintenance cost though is lower (average of Rs 1125 per month) as the vehicles are mainly 2 stroke diesel but the levels of pollution caused by these vehicles are very high.
4. Lack of proper infrastructure facilities like parking areas, rest rooms, workshops for repairs etc.
5. Lack of enforcement by Traffic police as the auto rickshaw stands are always encroached and therefore the autos stand on the road and causes congestion.
6. Competition increases between drivers since the fleet size keeps increases illegally as a lot of influx of population has taken place from the neighboring states.
7. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also the driver often does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 20-25%.But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income Also due to illiteracy among drivers therefore it is said that banks take advantage and make the drivers sign at a higher rate of interest.
8. Since the educational levels are lower therefore computerized driving test are not possible to be given and is leading to poor safety within operations.
9. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.

## User's survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 60 users on the basis of random sampling was carried out, at various locations. of city, rural and other routes by selecting various characteristics that they associate with this IPT mode

### b. Age group of users

From the survey it has been observed that all age groups of people use the IPT services. About 62% of the surveyed users belong to the age group 30 to 50 years. 30 % belongs to the age group up to 30 years. Above the age group of 50, only 8% uses the service. Therefore the IPT services are mostly used by the working population.

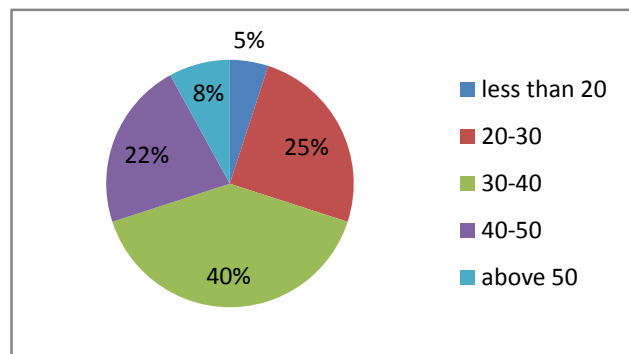


Figure 80 age profile of users

### c. Occupations of users

From the survey it is observed that more than 40 % of the users belong to the private firms. About 10 % of the users are government employed, students account for 13% and 10% to housewives. 17 % of people are having their own business in the city and another 10% is employed in industries.

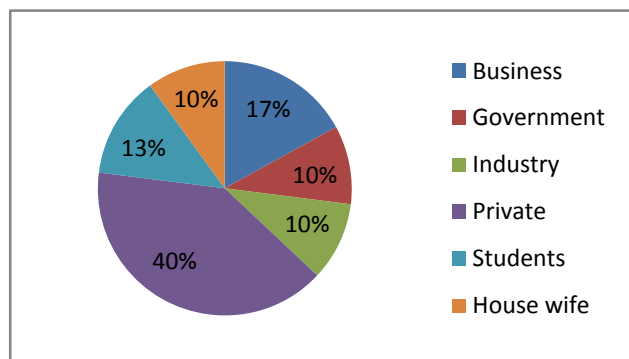


Figure 81 Occupation

#### d. Purpose of trip by IPT

It has been observed that 70 % of the trip purposes for which these IPT services are used are for work purpose and 20% for social purpose. Only 10 % uses for educational trips.

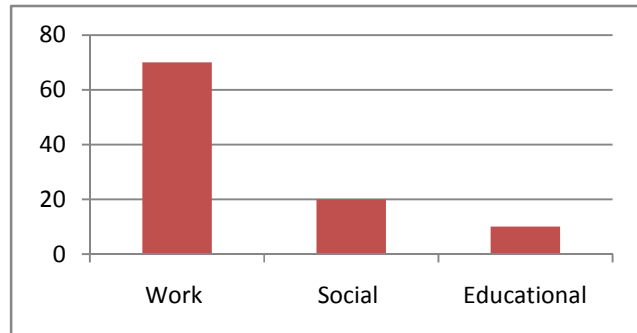


Figure 82 Trip purpose

#### e. Average distance travelled by passengers

It has been observed that 67 % of users travel by IPT up to 5 kms distance. However about 31% of the users travel between 5-15 kms as there are location of many industries at the periphery of the city and only more 2 % travel more than 15 kms.

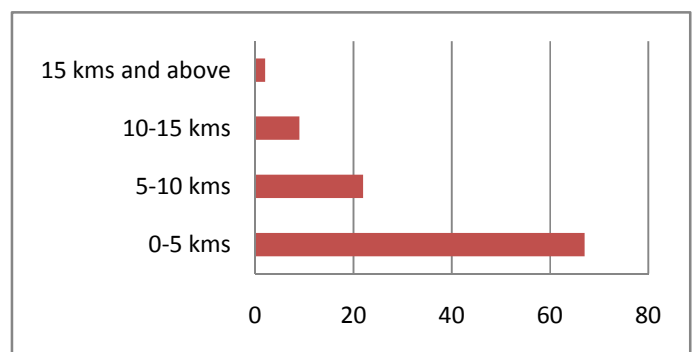


Figure 83 Average distance travelled by users

#### f. Expenditure per month

From the survey it has been observed that about 67 % of users spend monthly up to Rs 500 as mostly the three wheeler IPT are preferred for short distance travel and 27 % spend Rs 500 to Rs 1000. However only 6 % spend more than Rs 1000 as long distance travel.

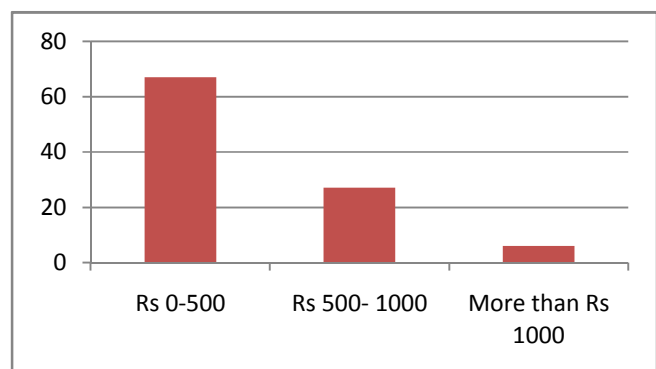


Figure 84 Expenditure per month

### g. Safety and Security

It has been stated that 85% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher especially for females and elderly.

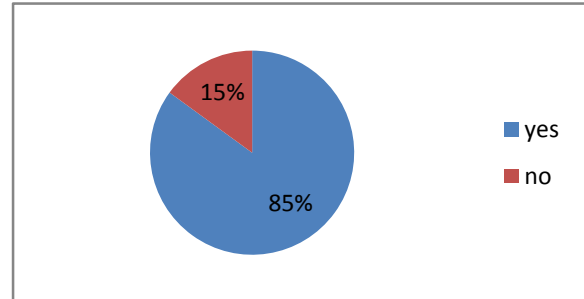


Figure 85 safety and security mechanism in IPT vehicles

### h. Reasons for usage of IPT other than Public transport

This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

- 1. Accessibility:** Nearly 69 % respondents found IPT to be more accessible. The main reason being availability of auto rickshaw whenever required at all locations, though night services are not provided.

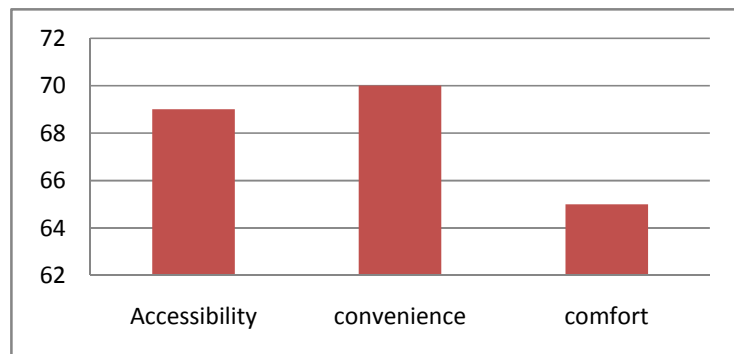


Figure 86 Reasons for usage of IPT

- 2. Convenience:** Another characteristic associated with their preference was convenience. Around 70% respondents find IPT to be more convenient again for the main reason being its easy availability. Also the waiting time for these IPT are generally lower compared to the public transport therefore the overall journey becomes very convenient.

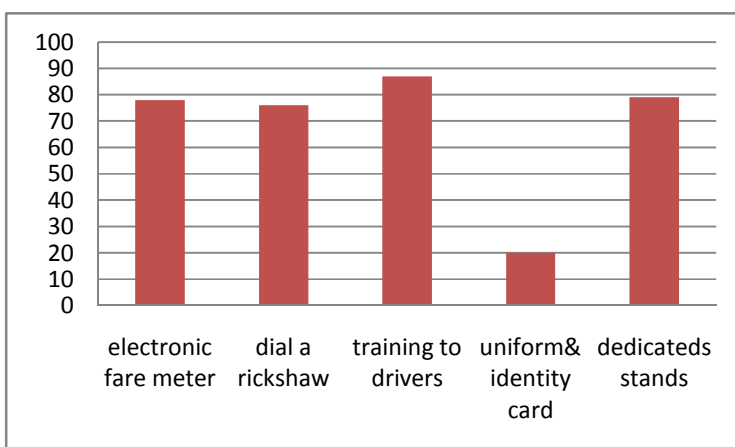


3. **Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. 65 % of the respondents using the service in Ranchi said that it is comfortable. However 35 % complains of dis comfort as more passengers are illegally carried and due to long waiting time at stops in order to get passengers, the users have to wait

**i. Other Suggestions for organizing services of IPT**

1. Usage of modern technology-

The fares are fixed by the unions but often the fare is bargained by the users and the operator. Therefore about 78 % of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.



**Figure 87 other suggestions**

2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 76 % passengers are willing to use the services. These users mostly travel to airport and railway stations.
3. Training to drivers on road safety and driving skills were also agreed by about 87 % of the users. As the drivers often drive rashly according to passenger's perception.
4. 79 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion from roads.

5. About 20% of users agreed that dress code should be maintained by the drivers and it should be enforced by the Traffic police as the city already has dress codes for drivers , but none follow it. Also identity cards should be issued to all drivers to ensure safety of passengers.

**j. Summary of findings from Users survey**

---

1. Since the fares are not regulated by RTO and are fixed by unions therefore the drivers charge illegally. Therefore often higher rates are charged for even shorter distance of travel.
2. Carriage of more passengers as compared to the design capacity of the rickshaws, leading to dis comfort.
3. Safety and security mechanisms are missing therefore the users especially females and elderly do not feel safe to use the services after evening.
4. Long waiting time at certain locations in search of passengers leads to dis comfort of commuters
5. Non availability of IPT services at nigh is also a major issue for commuters going to railway stations or in case of emergency.

# City Analysis -Chandigarh

## City Profile - Background

Chandigarh is a city in Northern India that serves as the capital of the states of Punjab and Haryana. The city tops the list of Indian States and Union Territories by per capita income in the country and the territory also headed the list of Indian states and territories according to Human Development Index. The present population according to the Census 2011 is 9.60 lakhs.

## Transport scenario

The city's public transport consists of 2 wheeler, 4 wheelers, bus, IPT and cycle rickshaws. The Chandigarh Transport Undertaking (CTU) operates public transport buses from its Inter State Bus Terminals (ISBT) of the city. CTU also operates frequent bus services to the neighboring states of Punjab, Haryana, and Himachal Pradesh and to Delhi.

At present the registered IPT in the city is more than 2000. The trip characteristics shows that 51 % trips are made by private transport, 7% IPT, bus 11%, 14 % cycles and Rickshaws and walk 17% ( CMP, 2009)

## IPT System

The type of IPT functioning in Chandigarh City is

### **IPT (3 wheelers)-**

This type of auto rickshaw is the commonly found auto rickshaw which operates on shared and personally hired basis. It provides connectivity from one destination to another on pre decided route and fares fixed by unions. . These IPT run as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another. It also acts as a major mode for Public transport in areas of absence of public transport.

### **Vikram (6-8 seater capacity) –**

This type of auto rickshaw is the commonly named as tempos or vikrams in the city and operates on a shared basis. These IPT are mainly registered IPT of Punjab and Haryana that ply within the city. These IPT accommodate more than 8 passengers to even 10 and 12 passengers as an illegal practice, especially during peak hours, as many people commute to the city from Panchkula and Mohali-the satellite towns. According to the directives of the court these types of vehicles are presently banned to enter into the city as these are said to be the main polluters within the city.

### **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city. Though aware, of the para transit system prevailing in the city, the authorities are not stringent about the violations and the number of illegal vehicles that are running in the city without permits even.

### **Routes and fares**

The routes and the fares of Para transit vehicles are not fixed by the RTO. These are generally fixed by the Auto unions. At times the autos maneuver their own routes according to peak demand of passengers also they prefer to drive in profitable routes. Therefore many portions of the city are not well connected.

Fares are fixed by unions at various locations but still the drivers charge illegally as there is absence of metered fares in the city. Revision of fares has is done more than 2 years.

### **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.500 along with the following documents:

- Driving License
- Residence proof

- Age proof
- Insurance certificate
- Dully filled in application form to the Regional Transport Officer.

The time taken for processing is less than 15 days from the date of application. The permit is renewed less than 3 years at a payment of same money as that for getting new permit. Penalties are charged according to the days of delay in the renewal process

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and Punjab Motor Vehicles Rules.

### **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. Only designated parking areas for auto rickshaw have been demarcated, though proper enforcement by Traffic Police is missing. Since there are encroachments on the parking stands therefore IPT still queue up seeking potential passengers at critical junctions, thus contributing to congestion levels. Also no workshops or repairing shops are provided for repair of the vehicles.

### **Vehicle characteristics**

At present nearly all the IPT are LPG run 4 stroke engines. Only the Punjab and Haryana IPT that run within the city are on diesel. However due to recent directives by the High Court all the IPT in the city are run on LPG except those that are IPT of Haryana and Punjab that are run on diesel.

### **Sample size for Auto rickshaw drivers and users survey**

Surveys were carried out for drivers and users of IPT in Indore city. 20 surveys for drivers and users were conducted through random sampling method at some of the busiest routes fixed for the IPT and the tempos. Some of the survey locations are Krishna nagar colony, Ranchi University, Lower Bazar, Railway station, Nizam Nagar.

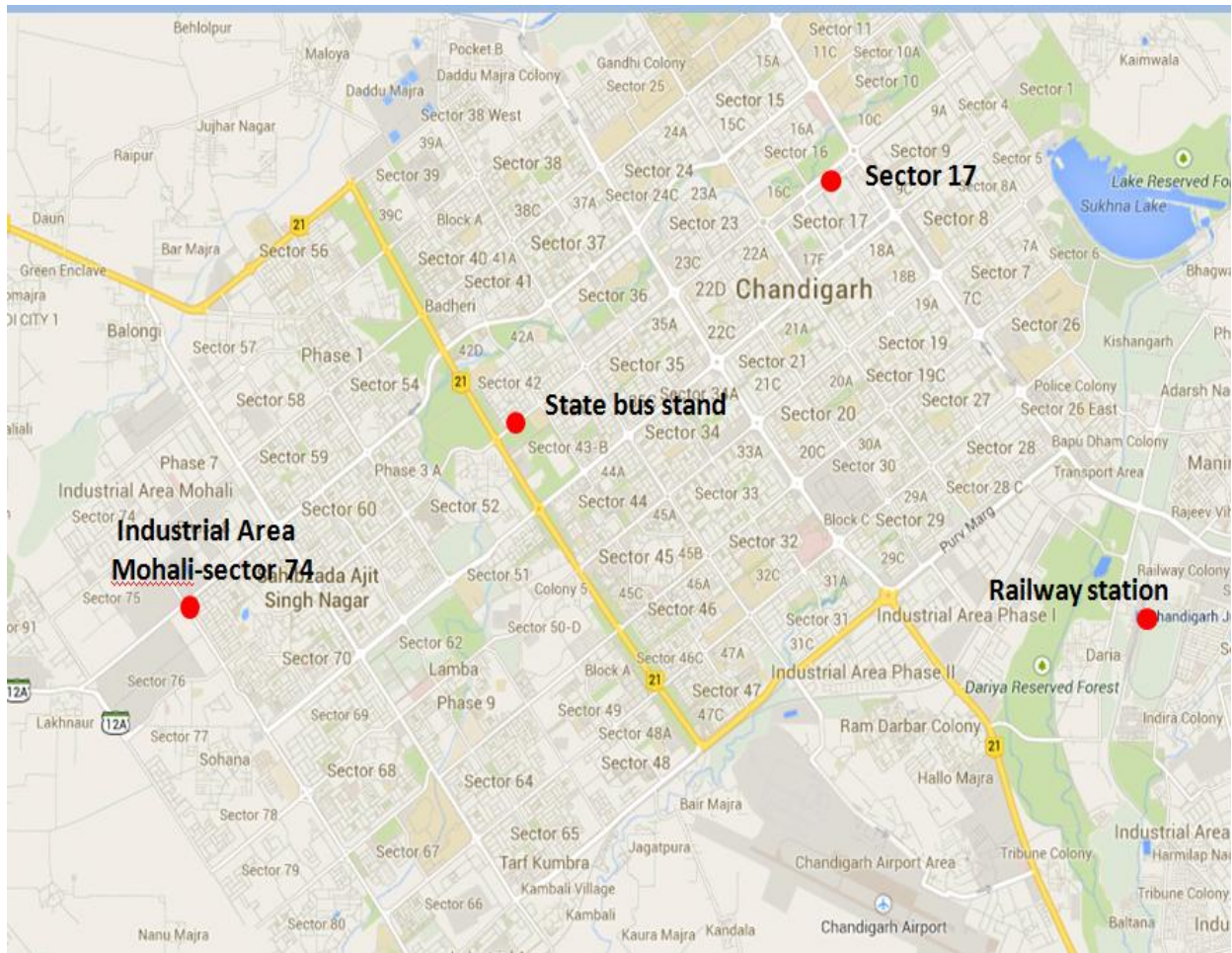


Figure 88 Survey location

## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

### a. Ownership of Vehicles

About 75 % of the drivers surveyed at various locations of the city stated that they have rented the three wheeler they drive. Owned is 25 % only. The main reason being that they have not enough money to purchase an auto

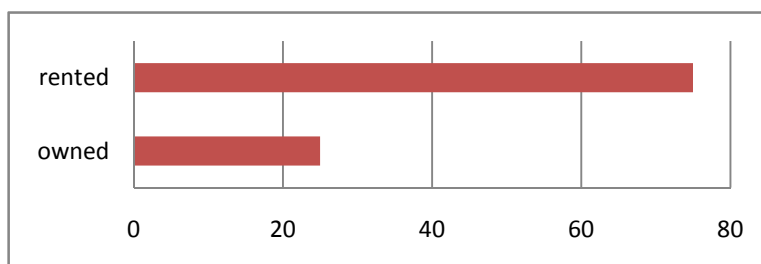


Figure 89 Ownership of vehicles

rickshaw and purchasing an auto rickshaw through a loan from the bank is a lengthy process due to much of documentation required (as mentioned in previous chapters). It is also observed that majority of the owners own about 1 to 5 IPT. The rent paid by operators to the owners approximately is Rs 200 per day.

### b. Revenue earned per day

75 % the drivers of IPT stated that the average revenue collected per day is between Rs 200-400. The average revenue per month is Rs 9000. 75% stated that revenue varies between Rs 400 to Rs 600 (average revenue per month is Rs 15,000) and only 15 % revenue is between Rs 600 to

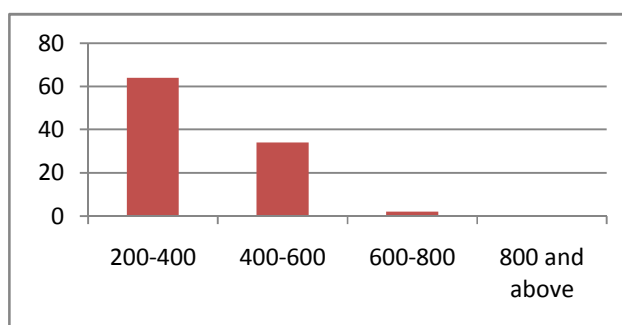


Figure 90 Revenue Earned / month by auto

800 (average per month is Rs 21,000) . The earning is higher generally found in case of IPT that operates near to high demand points like airport or railway station, as these operate like prepaid taxis charging higher fares from passengers. Other than fare box revenue no other permissions for revenue generation like advertisements, participation in rallies, schools etc are not given by the government. . Comparative table showing earning of rented and owned four wheelers are given below:

Table 1 Revenue earned per month

Descriptions		Earning per day	Average earning per month	Rent/day	Total earning per month
Income in case of rented IPT	Private services	Rs 200-Rs 400	Rs 9,000	Rs 200	Rs 3,000
Income in case of owned IPT	Private services	Rs 200-Rs 400	Rs 9,000	-	Rs 9,000
Income in case of rented IPT	Shuttle services	Rs 400-Rs 600	Rs 15,000	Rs 200	Rs 9,000
Income in case of owned IPT	Shuttle services	Rs 400-Rs 600	Rs 15,000	-	Rs 15,000
Income in case of rented IPT	Airport & railway services (taxi services)	Rs 600-Rs 800	Rs 21,000	Rs 200	Rs 15,000
Income in case of owned IPT	Airport & railway station services (taxi services)	Rs 600-Rs 800	Rs 21,000	-	Rs 21,000

**c. Average length travelled by auto per day**

About 78 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms and only 22 % stated that the average length travelled to be between 100-150 kms. These long distance travel trips cater to the inter city trips from Punjab and Haryana that passes through the city.

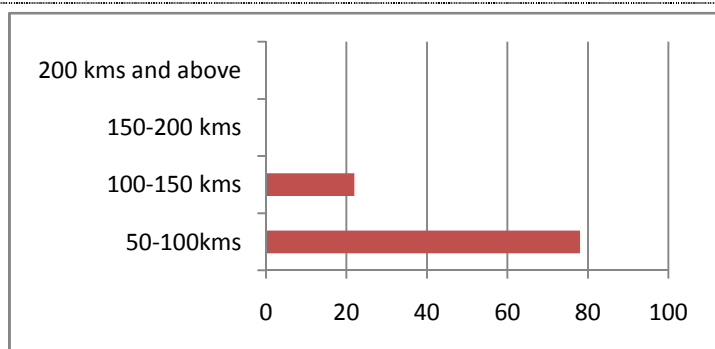


Figure 91 Average length travelled /auto/day



#### d. Passengers travelled per day per auto

It is stated that about 34% of drivers carries less than 40 passengers per auto per day, as these are usually the small three wheeler IPT that are run on personal. However 44% carries 40 to 80 passengers and only 22 % carries above 80 passengers' .These

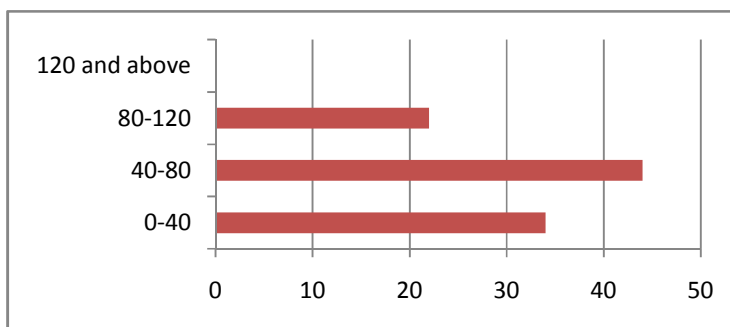


Figure 92 Passengers travelled per day per auto

routes are generally the shared

routes and IPT entering the city from Punjab and Haryana side are often overloaded.

#### e. Funding Provisions to operators

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents (refer to previous chapter) required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest of 20 -25% as compared to

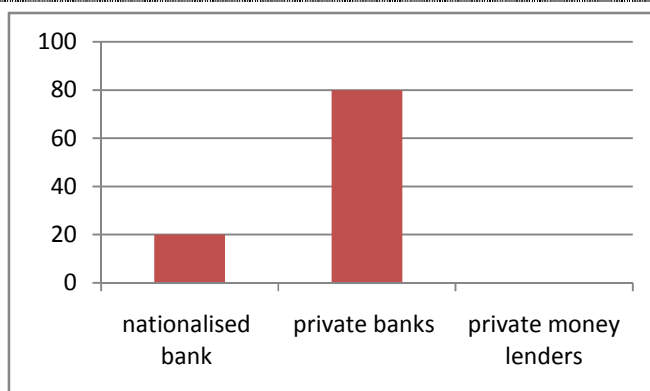
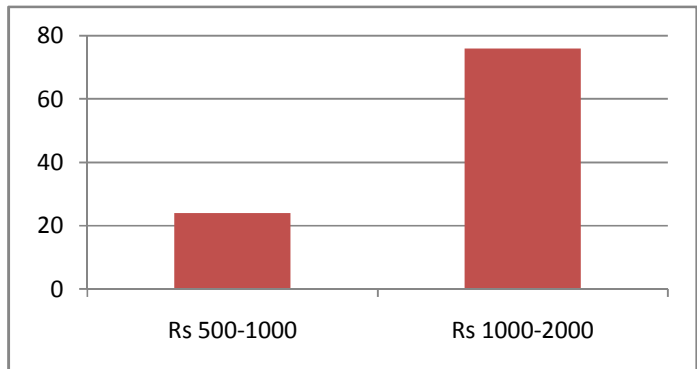


Figure 93 Financing IPT

nationalised banks which charge from 10.5- 12.5%. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 80% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks even though it being a legal procedure. About 20 % get loans from the nationalized banks.

**f. Maintenance cost of vehicles**

About 24 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 500-1000. The average maintenance cost per month is Rs 750. Only 76 % stated that the cost of maintenance of the vehicles per month is from Rs 1,000-Rs 2000 (average Rs 1500/month). The reason for lower

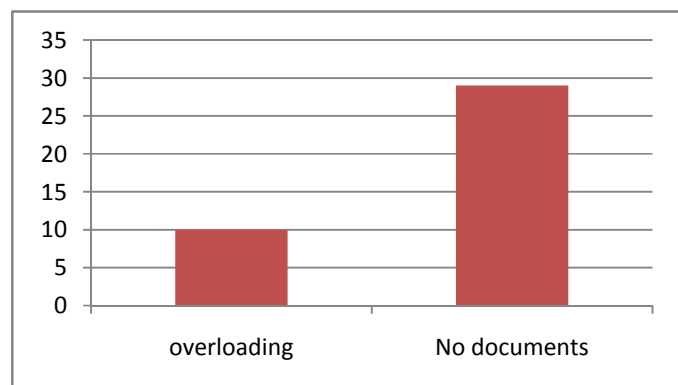


**Figure 94 Maintenance cost /month**

maintenance cost is because 2 stroke diesel engines that are run by Punjab and Haryana are much cheaper to repair compared to LPG fuel.

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for without permit or documents etc. About 10 % of the shared autos are fined for overloading as these operate between Haryana and Punjab state, through the city. 29 % is fined for no documents. However the traffic penalties are often converted into sources of bribe for the city traffic



**Figure 95 Reasons for bribes/penalties**

officials. The total income and expenditure are given below:

Table 2 Total income and expenditure of auto drivers

Descriptions		Total earning per month (In Rs)	Maintenance cost/month*(In Rs)	Payment to police /week (Rs)	Total expenditure /month (in Rs)	Total revenue/ month (in Rs)
Income in case of rented IPT	Private services	Rs 3,000	1, 125	-	1, 125	1875
Income in case of owned IPT	Private services	Rs 9,000	1,125	-	1,125	7,875
Income in case of rented IPT	Shuttle services	Rs 9,000	1, 125	-	1, 125	7,875
Income in case of owned IPT	Shuttle services	Rs 15,000	1, 125	-	1, 125	13,875
Income in case of rented IPT	Airport & railway services (taxi services)	Rs 15,000	1, 125	-	1, 125	13,875
Income in case of owned IPT	Airport & railway station services (taxi services)	Rs 21,000	1, 125	-	1, 125	19,875

\*average of maintenance cost per month taken

#### h. Association with unions

There is presence of two registered unions for the three wheeler IPT. The association is sustaining itself by providing benefits like educational, health care facilities etc. However in real terms the drivers are happy associating with the trade unions as these provide benefits to drivers.

**i. Other problems**

---

1. As per the driver's survey 73 % of the drivers have obtained only primary education, 26 % are secondary educated and 1% are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like housing, medical facilities, and education facilities.
3. IPT is rarely used mode of transport as most of the households in the city own their own private vehicles or travel by buses.

**j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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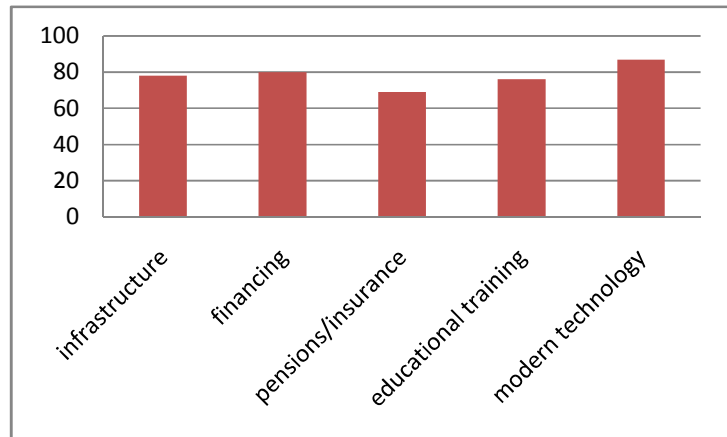
In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

**Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 65 % respondents in Chandigarh suggested for provision of more parking areas for IPT, which in turn would reduce hassles of the traffic police on daily basis. Also proper enforcement from the traffic police so that other modes of transport do not block the parking areas of these IPT. However the rest 40 % of the respondent do not feel the need for any further parking areas as these are already provided by the Municipal Corporation.

## Financing

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out money for providing charges to traffic police, rent to owners etc which decreases their revenue earnings. Hence a common criteria that both the auto



rickshaw drivers and unions (72%) **Figure 96 Suggestions for improvement**

suggested that the financing procedure of IPT should be made easier and loans would be provided at a lower rate from the banks.

## Pensions/Insurance

About 70 % of auto rickshaw driver feels that insurance should be given insurance for their future security, as the drivers are providing services to general public.

## Training Programmes:

About 73 % of respondents in Chandigarh agreed to undergo training and educational training programmes for providing better service to customers

## Usage of modern technology

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then only 70 % of the drivers suggested for such improvement to be added.

#### **k. Summary of findings from drivers survey**

---

1. From the survey it is found that the three wheelers rented IPT that run on private basis and the shuttle services do not earn the minimum wages of Rs 9002.1 (Refer table 2) to provide better future to their family.
2. It is noted from the survey that as a result of tempos plying within the city therefore the pollution is higher as most of these are run on diesel.
3. It is also seen that LPG gas stations are less in number therefore drivers often face problem. .
4. Lack of proper infrastructure facilities like rest rooms, workshops for repairs etc.
5. Lack of enforcement by Traffic police as the auto rickshaw stands are always encroached and therefore the autos stand on the road and causes congestion.
6. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also the driver often does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 20-25%.But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.
7. Since the educational levels are lower therefore it leads to poor safety within operations..
8. No training on regular basis or personal benefits like education, house, medical facilities are given to drivers from the government side.

## User's survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 20 users on the basis of random sampling was carried out, at various locations. of city, rural and other routes by selecting various characteristics that they associate with this IPT mode

### a. Age group of users

From the survey it has been observed that all age groups of people use the IPT services. About 58% of the surveyed users belong to the age group 30 to 50 years. 34 % belongs to the age group up to 30 years. Above the age group of 50, only 8% uses the service. Therefore the IPT services are mostly used by the working population.

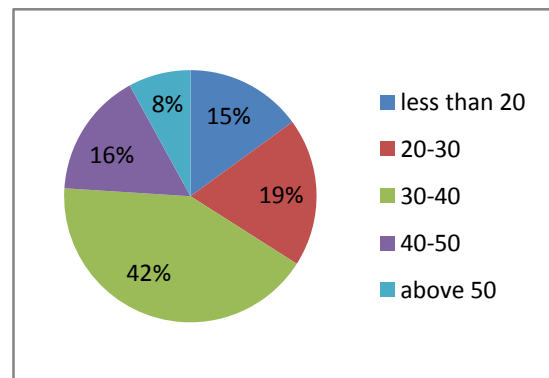


Figure 97 age profile of users

### b. Occupations of users

From the survey it is observed that more than 38 % of the users belong to the private firms. About 13 % of the users are government employed, students account for 14% and 11% to housewives. 14 % of people are having their own business in the city and another 10% is employed in industries.

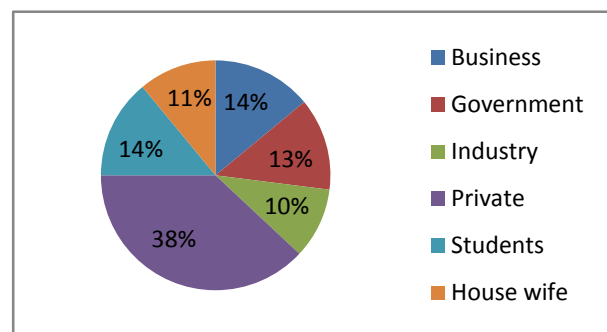


Figure 98 Occupation

### c. Purpose of trip by IPT

It has been observed that 47 % of the trip purposes for which these IPT services are used are for work purpose and 43% for social purpose. Only 10 % uses for educational trips.

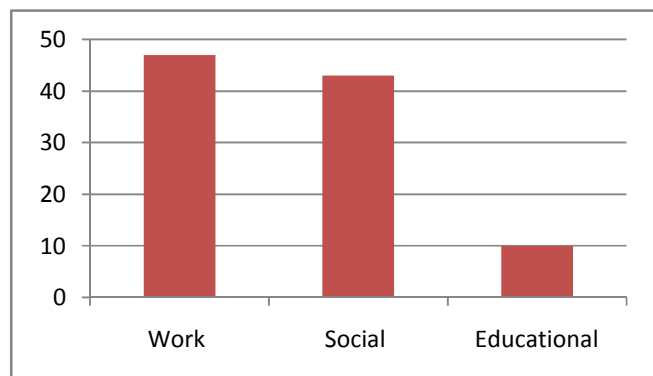


Figure 99 Trip purpose

### d. Average distance travelled by passengers

It has been observed that 70 % of users travel by IPT up to 5 kms distance. However about 28% of the users travel between 5-15 kms as there are location of many industries at the periphery of the city and only more 2 % travel more than 15 kms.

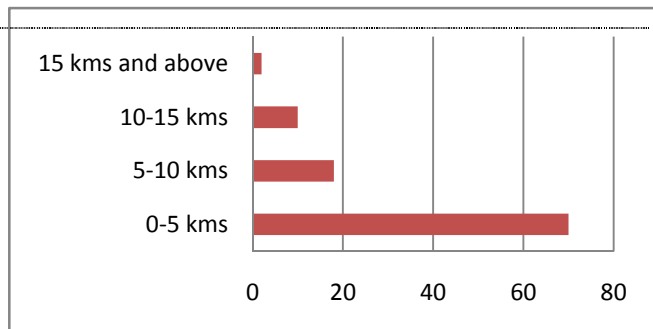


Figure 100 Average distance travelled by users

### e. Expenditure per month

From the survey it has been observed that about 50 % of users spend monthly up to Rs 500 as mostly the three wheeler IPT are preferred for short distance travel and 47 % spend Rs 500 to Rs 1000, as people travel to the industrial areas that are nearby the city. The people that travel more spend more in transport.

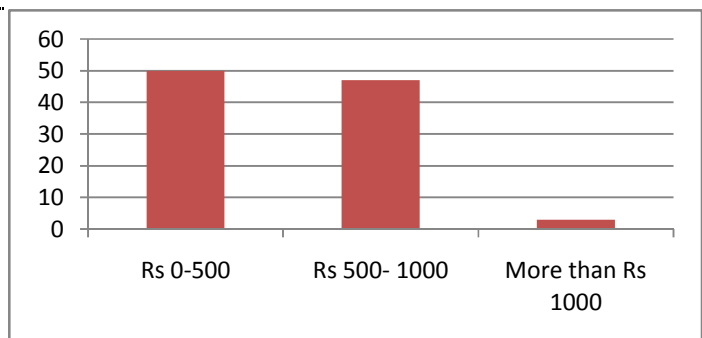


Figure 101 Expenditure per month



#### f. Safety and Security

It has been stated that 81% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher especially for females and elderly.

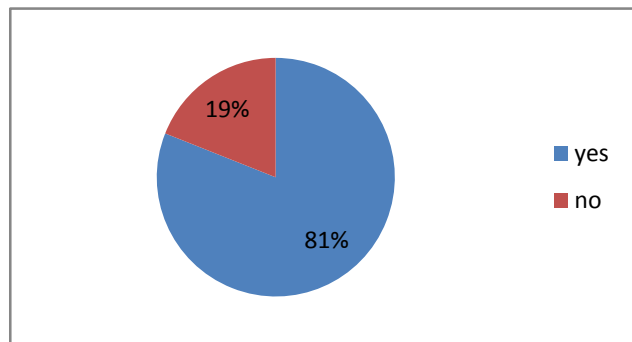


Figure 102 safety and security mechanism in IPT vehicles

#### g. Reasons for usage of IPT other than Public transport

This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

**4. Accessibility:** Only 55 % respondents found IPT to be more accessible. The main reason for lower response is due to unavailability of auto rickshaw after 11 pm at night and also due to bunching of IPT in fewer routes, therefore often people do not find it accessible in few locations of the city.

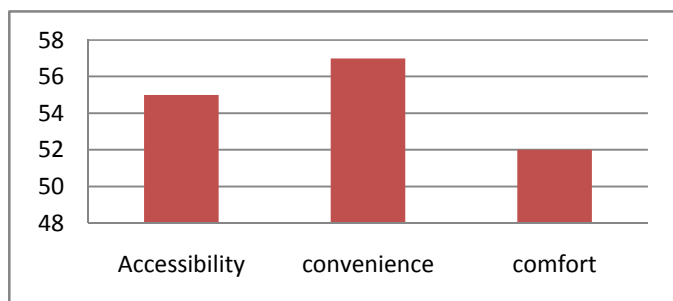


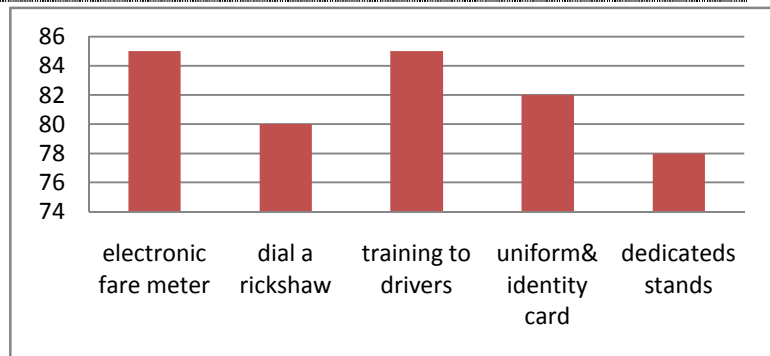
Figure 103 Reasons for usage of IPT

**5. Convenience:** Another characteristic associated with their preference was convenience. Only 57 % respondents find IPT to be more convenient the main reason for weak response amongst users is due to increase waiting time for these IPT and its accessibility only at few locations and since most of the users are car owners therefore people do not prefer to use IPT.

**6. Comfortable:** Only 52 % respondent's finds that using IPT is comfortable as these provide point to point services. However the other half does not think it to be comfortable as commuters have to wait for long time and also routes of autorickshaws are concentrated in few areas only.

**h. Other suggestions for organizing services of IPT**

**1. Usage of modern technology-**  
The fares are fixed by the unions but often the fare is bargained by the users and the operator. Therefore about 85 %



**Figure 104 other suggestions**

of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.

**2.** When users were made aware of the usage of old panic button, dial a rickshaw services then about 80 % passengers are willing to use the services. These help to increase the accountability of the drivers and improve safety of passengers.

**3.** Training to drivers on road safety and driving skills were also agreed by about 85 % of the users. As the drivers often drive rashly according to passenger's perception.

**4.** 78 % users agreed to fixing dedicated parking and stands for IPT with proper enforcement by Traffic Police to remove the chaos and congestion from roads.

**5.** About 82% of users agreed that dress code should be maintained by the drivers and it should be enforced by the Traffic police as the city already has dress codes for drivers, but none follow it. Also identity cards should be issued to all drivers to ensure safety of passengers.

**6.**

**i. Summary of findings from Users survey**

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1. Since the fares are not regulated by RTO and are fixed by unions therefore the drivers charge illegally. Therefore often higher rates are charged for even shorter distance of travel.
2. Bunching of IPT on few routes leads to more discomfort amongst commuters.
3. Safety and security mechanisms are missing therefore the users especially females and elderly do not feel safe to use the services after evening.
4. Long waiting time at certain locations in search of passengers leads to discomfort of commuters
5. Non availability of IPT services at night is also a major issue for commuters going to railway stations or in case of emergency.

# City Analysis- Surat

## City Profile - Background

Surat is Gujarat's second largest city with a population of 44.62 lakhs (2011 census). The city registered an annualized GDP growth rate of 11.5 per cent over the seven fiscal years between 2001 and 2008. Surat ranks 4th in a global study of fastest developing cities conducted by The City Mayors Foundation, an international think tank on urban affairs.

## Transport scenario

In August 2008, the CNG-fuelled bus service was opened by the city Mayor. However due to low frequency of buses shared IPT became the main mode of local travel. Bus rapid transit system is also planned for the city .The first route for BRTS started its operation in 2014. In August 2012, plans for an intra city metro train service were approved by Chief Minister.

The total number of registered IPT in the city is approximately 88,000 (RTO Surat, 2012-2013). Trip characteristics show that 36 % trips are made by walking, 10% on bicycle, 21% by auto rickshaw, 1% by Public transport(PT) and around 30% by private motorized transport (CES Study, 2005).

## IPT System

There is only one of IPT functioning in Surat City

### Auto rickshaw (3 seater capacity) –

Informally run 3 seater shared auto-rickshaws have emerged as a popular mode of transport due to absence of the PT system in the city. Even though the new PT system is recently introduced but people still prefer auto rickshaw. There are no fixed routes, except for drivers who have themselves chose to ply according to passenger availability.

Fares charged by drivers are between Rs. 4 – 7 on any routes. Also drivers can operate on personally hired basis on any routes depending on demands of the passengers like airport and

railway stations. Though fares are fixed by the Government notifications but are often not followed by drivers as the meters provided in the vehicles do not work. Therefore the drivers charge illegally. There are no fixed timings for the service to stop – this business is purely demand driven; service time depends on the time till there are customers willing to ride.

### **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city. Highly aware, of the shuttle system prevailing in the city, the authorities take advantage by receiving bribes from the drivers to continue their operations. Due to such practices Auto drivers' associations have been demanding for a long time that shared IPT in the city be legalized.

### **Routes and fares**

The routes of IPT are not fixed by the RTO. But the unions have more or less fixed the routes depending upon the demand of passengers. Approximately 123 informal routes have been established according to the demand of the commuters.

The fare structure is fixed by the RTO by notification from the government on basis of rise in fuel prices. Fares are regularly revised at a period of 1 year. Though meters have been provided in the vehicles but none are functional, therefore often the drivers charge illegally. The shared IPT charge between Rs 4- Rs 7.

### **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.350 along with the following documents:

- Filled PCOP form (application form) to the Regional Transport Officer.
- Residence Proof
- Minimum 8th standard Pass certificate
- Driving license

- Age proof
- Permit fee

The time taken for processing is less than 15 days from the date of application. The permit is renewed after every 5 years at a payment of Rs 200.

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act and Gujarat state motor vehicles Rules 1989.

### **Infrastructure for IPT**

Since auto rickshaw operations in Surat are not formally recognized, therefore no special infrastructure for them. Earlier stands had been provided at certain location which were dismantled and reconstructed for the city bus service. Thus deprived of proper stands, the drivers encroach the major junctions, and in order to not get caught by the authorities. Also no workshops or repairing shops are provided for repair of IPT Vehicles.

### **Vehicle characteristics**

Within the city limits of Surat all the IPT are CNG 2 stroke, however the IPT that run outside the boundary of Municipal Corporation are all diesel run. In Ahmedabad though conversions from 2 strokes to 4 stroke engines have already started, but in Surat still no conversion has taken place

### **Sample size for Auto rickshaw drivers and users survey**

Surveys were carried out for drivers and users of IPT in Surat city, 88 surveys for drivers and user surveys through random sampling method were conducted at important locations of Surat. Few of the busiest and non busiest routes were surveyed to get feedback from the drivers and users in the city. Survey locations in the city are: Railway stations, Nanpura, Udhna City bus depot, Canal road and Vishal Nagar

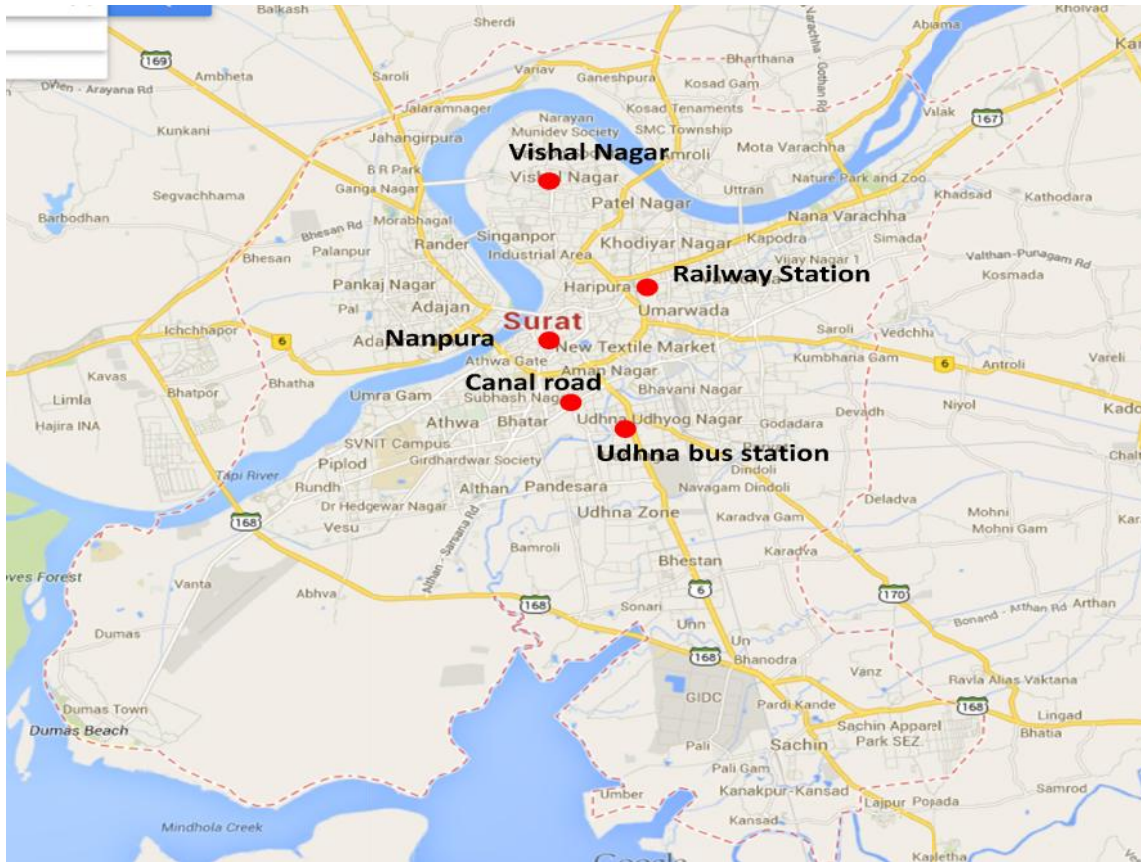


Figure 105 Survey Locations

## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

### a. Ownership of Vehicles

About 74 % of the drivers surveyed at various locations of the city stated that they have rented the auto rickshaw they drive. Ownership in Surat is only 26 %. The main reason being that, they have not enough money to purchase an

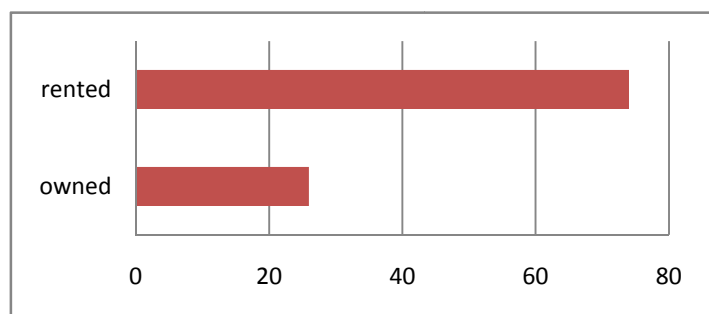
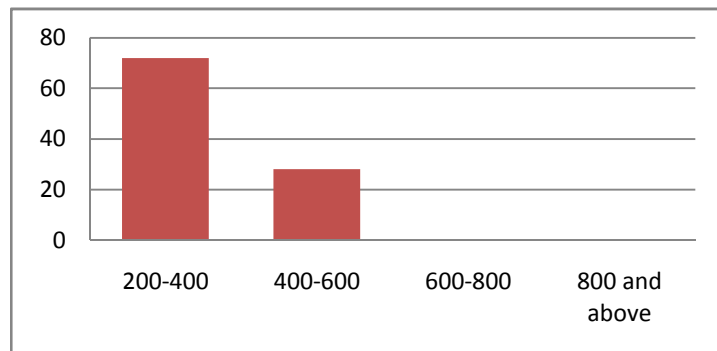


Figure 106 Ownership of vehicles

auto rickshaw and purchasing an auto rickshaw through a loan from banks is a lengthy and a tedious process due to too much documentation required (Documents required are given in section g). It is also observed that out of the owners majority owns about 1- 5 IPT. Also the rent paid by the drivers to their owners on an average is Rs 150 daily.

**b. Revenue earned per day**

62% the drivers stated that the revenue collected per day varies between Rs 200- Rs 400. The average earning per month is Rs 9000. However of about 38% of the shuttle drivers said that the



revenue collected per day varies between Rs 400 to Rs

**Figure 107 Revenue earned per day**

600. The average income earned per month is therefore Rs 15,000. The main reason for such variation in revenue collection is because the shuttle services carries illegally greater number of passengers compared to the actual design of vehicles and also these drivers charge more fares at few locations like airport and railway stations. However the IPT that are rented have to pay on average of Rs 150 daily to their owners from the daily earnings. Other than fare box revenue few of the IPT has school permit and carry school children. These IPT charge per student an amount of Rs 200 per month. Comparative table showing earning of shuttle and general IPT are given below:

**Table 1 Revenue earned per month**

Descriptions		Earning per day	Average earning per month	Rent/day	Total earning per month
Income in case of rented IPT	Shuttle services	Rs 200- Rs 400	Rs 9000	Rs 150	Rs4,500
Income in case of owned IPT	Shuttle services	Rs 200- Rs 400	Rs 9000	-	Rs 9,000
Income in case of rented IPT in overloaded routes	Shuttle services	Rs400- Rs 600	Rs 15,000	Rs 150	Rs 10,500



Income in case of rented IPT in overloaded routes	Shuttle services	Rs400- Rs 600	Rs 15,000	-	Rs 15,000
Income in case of rented IPT+ school permits	Shuttle services	Rs 200- Rs 400 + Rs 1200*	Rs 9000+ Rs 1200= Rs 10,200	Rs 150	Rs 5,700
Income in case of owned IPT + school permits	Shuttle services	Rs 200- Rs 400+Rs 1,200*	Rs 9000+ Rs 1200= Rs10,200	-	Rs10,200
Income in case of rented IPT in overloaded routes + school permits	Shuttle services	Rs400- Rs 600+ Rs 1200*	Rs 15,000+Rs 1,200=Rs 16,200	Rs 150	Rs 11,700
Income in case of rented IPT in overloaded routes + school permits	Shuttle services	Rs400- Rs 600+ Rs 1200*	Rs 15,000+Rs 1200=Rs 16,200	-	Rs 16,200

\* Maximum of 6 students is carried according to permit given.

### c. Average length travelled by auto per day

About only 36 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms and 64 % stated that the average length travelled to be between 100-150 kms.

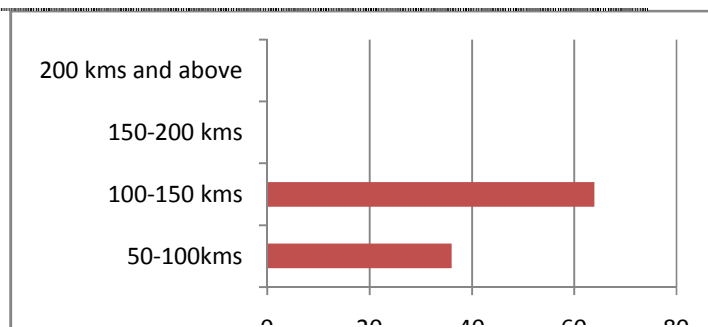


Figure 108 Average length travelled /auto/day

**d. Passengers travelled per day per auto**

It is stated that about 38 % of drivers carries not more than 40 passengers per auto per day. 62 % of drivers states that they carry between 40-80 passengers per auto per day. This difference is due to shuttle services carrying more passengers illegally.

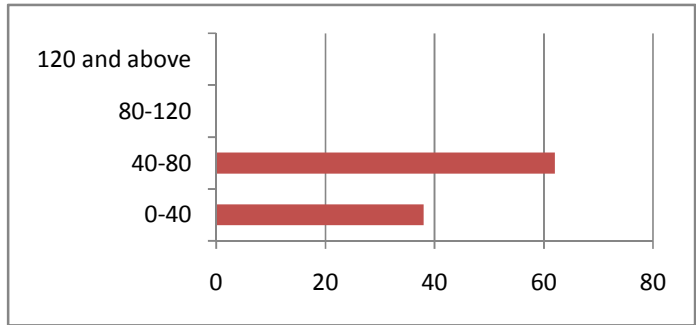


Figure 109 Passengers travelled per day per auto

**e. Funding Provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents (mentioned in earlier chapters) required by the banks to finance

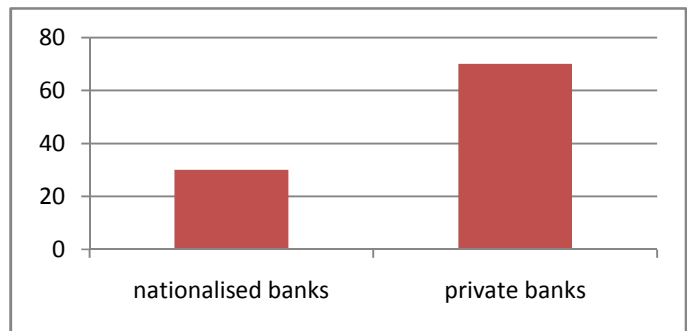
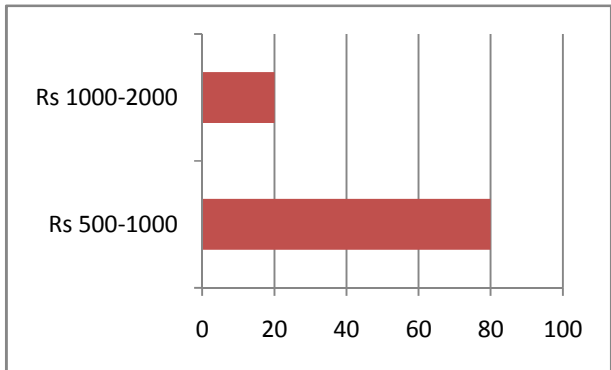


Figure 110 Financing IPT

the loan. Hence the driver feels it easy to resort to a private financier (mentioned in earlier chapters) even though the financier charges higher interest of 25% as compared to nationalised banks which charge 12.5%. Some of the common financiers are Indus land bank, Kotak Mahindra Finance and other private lenders etc. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 70% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks even though it being a legal procedure.

**f. Maintenance cost of vehicles.**

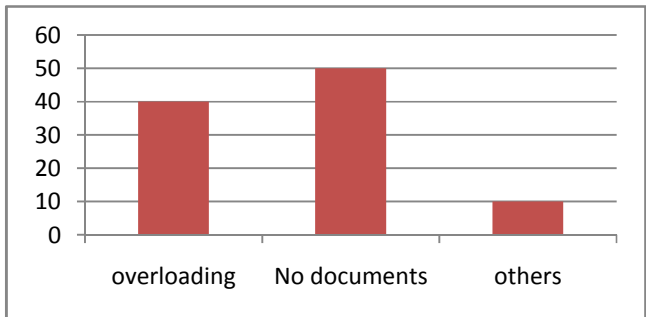
About 80 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 500 to Rs 1000 (Average Rs 750/ month). Whereas only 20 % stated that the cost of maintenance of the vehicles per month is between Rs 1000-Rs 2000(average Rs 1500 / month). The cost in the previous case is lower as maintenance cost of 2 stroke engines is lower. Majority of the drivers use local parts from the market as a form of replacement for the old parts compared to the rest that use proper substitutes. Therefore the maintenance cost is lower in these cases.



**Figure 111 Maintenance cost per month**

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for overcrowding and inadequate documents and other reasons. However, the traffic penalties are often converted into a source of bribe by the city traffic officials. The illegal shuttle operations found in the Surat city area, as per the driver survey states that the fine charging receipt is different from the receipts charged in other cities therefore the drivers in Surat have to at least pay on an average Rs. 700 per month to the officials, which results in lower revenue earnings and also compels them to ferry more passengers per trip in order sustain their costs per trip. Thus drivers are at a loss the most in case of Surat, as compared to other cities.



**Figure 112 Reasons for bribes/penalties**

**Table 2 Total income and expenditure of auto drivers**

Descriptions		Total earning per month (In Rs)	Maintenance cost/month*(In Rs)	Bribes to traffic police/per month(Rs)	Total expenditure /month (in Rs)	Total revenue/month (in Rs)
Income in case of rented IPT	<b>Shuttle services</b>	4,500	1,125	-	1,125	3,375
Income in case of owned IPT	<b>Shuttle services</b>	9,000	1,125	-	1,125	7,875
Income in case of rented IPT in overloaded routes	<b>Shuttle services</b>	10,500	1,125	Rs 700	1,825	8,675
Income in case of rented IPT in overloaded routes	<b>Shuttle services</b>	15,000	1,125	Rs 700	1,825	13,175
Income in case of rented IPT+ school permits	<b>Shuttle services</b>	5,700	1,125	-	1,125	4,575
Income in case of owned IPT + school permits	<b>Shuttle services</b>	10,200	1,125	-	1,125	9,075
Income in case of rented IPT in overloaded routes + school permits	<b>Shuttle services</b>	11,700	1,125	Rs 700	1,825	9,875
Income in case of rented IPT in overloaded routes + school permits	<b>Shuttle services</b>	16,200	1,125	Rs 700	1,825	14,375

\*average of maintenance cost per month taken

#### **h. Association with unions**

There are around 19 unions in Surat, out of which only 3 are registered and work actively. The association is trying to sustain itself by suggesting benefits to auto rickshaw drivers in terms of healthcare facilities, insurance, and education facilities for their children. However, from the

driver survey, when asked the reason for being not associated with any such associations, the common answer got was that there is no such benefit as to be provided by these associations except to organize strikes during fare hikes, which is in turn negative to their business and also they have to shelve out the membership fees.

**i. Other problems**

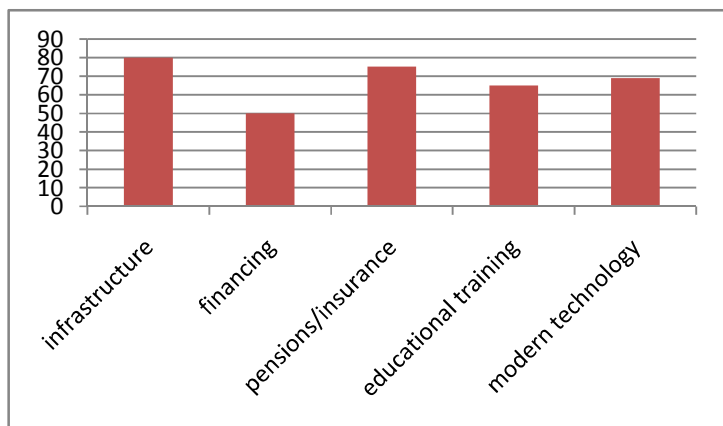
1. As per the driver’s survey 42% of the drivers have obtained primary education and 30 % secondary. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, education facilities

**j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

**Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 80% respondents in Surat



**Figure 113 Suggestions for improvement**

suggested for provision of auto rickshaw stands at appropriate locations for their improvement which enables access to get passengers easily, which in turn would also reduce the hassles they have to deal with traffic police on daily basis for encroaching the roads while waiting for potential passengers at critical locations.

## **Financing**

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out daily rent which decreases their revenue earnings. Hence common criteria for both the auto rickshaw drivers and unions (50%) suggested that the financing procedure of IPT should be made easier. And also they suggested that it would be better if government comes up with beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

## **Pensions/Insurance**

An auto rickshaw driver feels that though it is a business, in a way he is doing a public service, and so he should be offered benefits in terms of government scheme pensions so that he does not feel insecurity for his future. 75% respondents in Surat feel that they should be given pension/insurance for their future security.

## **Training Programmes:**

About 65 % of respondents in Surat agreed to undergo training and educational training programmes for providing better service to customers.

## **Usage of modern technology**

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then 69 % of the drivers suggested for such improvement to be added. The rest are of the opinion that if subsidies or of free cost the GPS is given by government then such technology could be added.

## **k. Summary of findings from drivers survey**

---

1. Auto rickshaw driver on an average earns Rs. 200- 400 per day which does not enable him to provide a better future to his family (Refer table1 and 2). Also the earning from rented IPT is lower than owned rickshaws. However the autos doing dual work like

working with school permit and passenger's movement permit earn more compared to the normal IPT. It is also observed that 3 wheeler autos drivers that do not operate on profitable routes do not even earn the minimum wages as fixed by the Labour Welfare Department of Gujarat (Rs 6810 per month).Therefore these are said to be the worse sufferers.

2. Lack of proper infrastructure facilities like auto stands, parking areas, workshops for repairs etc.
3. Removal of bribes and strong enforcement levels will lead to better earning of the drivers.
4. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 25%.But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.
5. Since the educational levels are lower therefore computerized driving test are not possible to be given.
6. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.

### **Users survey**

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 88 users on the basis of random sampling was carried out, at various locations. by selecting various characteristics that they associate with this IPT mode

**a. Age group of users**

From the survey it has been observed that all age groups of people use the IPT services. 17 % belongs to the age group of less than 20 years. 20 % belongs to the age group between 20- 30 years, 35% of the surveyed users belong to the age group of 30 to 40 years. Above the age group of 40, only 28 % use the IPT, as it provides door to door services for elderly citizens. Young population is mostly the users of the system.

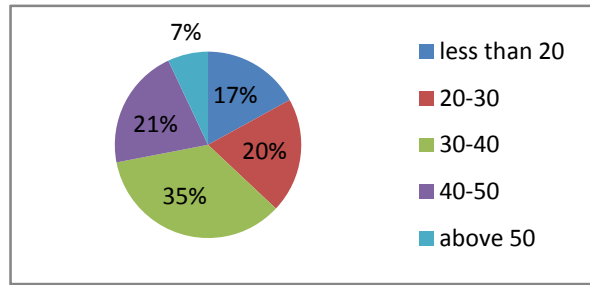


Figure 114 age profile of users

**b. Occupation of users**

From the survey it is observed that 23 % belongs to business class, 29 % to industrial sectors, private and students each of 15 %, 10 % of the government uses IPT services and only 8% for housewives.

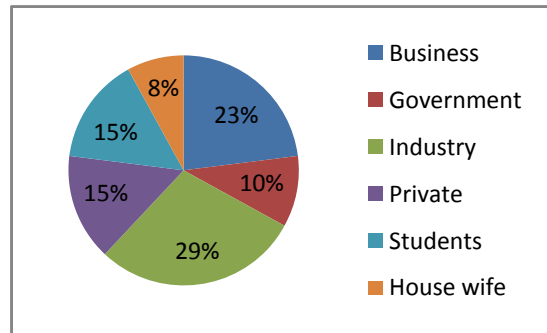


Figure 115 Occupation

**c. Purpose of trip by IPT**

It has been observed that 78 % of the trip purposes for which these IPT services are used are for work purpose and 10% for social purpose and 12 % for educational trips.

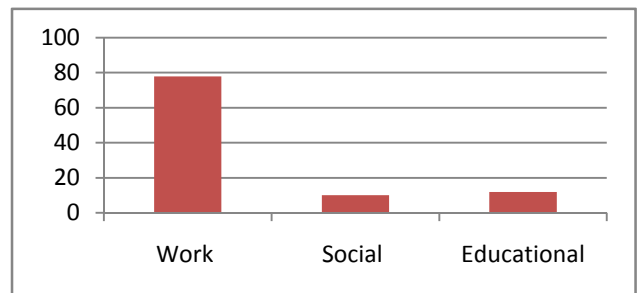


Figure 116 Trip purpose

**d. Average distance travelled by passengers**

It has been observed that 74% of users travel by the IPT is for small to medium distance trips

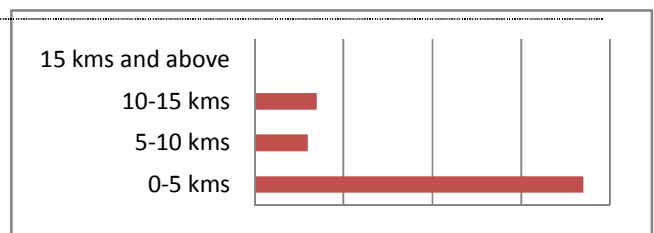


Figure 117 Average distance travelled by users



of not more than 5 kms. However about 26 % of the users travel more than distance of 5 kms and above, as some population also migrates out for employment to the nearby SEZ and industrial areas that have developed.

**e. Expenditure per month**

From the survey it has been observed that about 55 % of users spend monthly of less than Rs 500 for using IPT services. 30 % spends between Rs 500- Rs 1000 and only 15 % more than Rs 1000. The spending in IPT is lower as the maximum distance travelled by commuters is mostly 5 kms and secondly the fares charged are also lower.

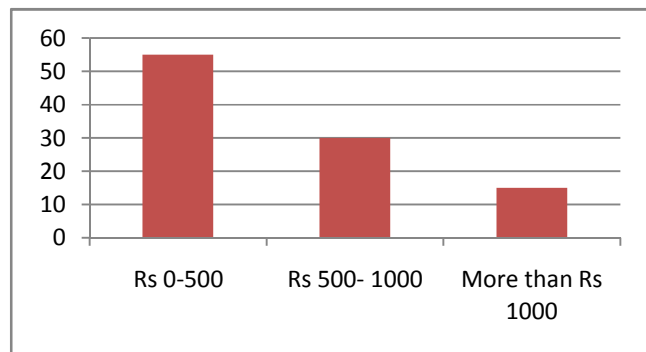


Figure 118 Expenditure per month

**f. Safety and Security**

It has been stated that 95% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore very high.

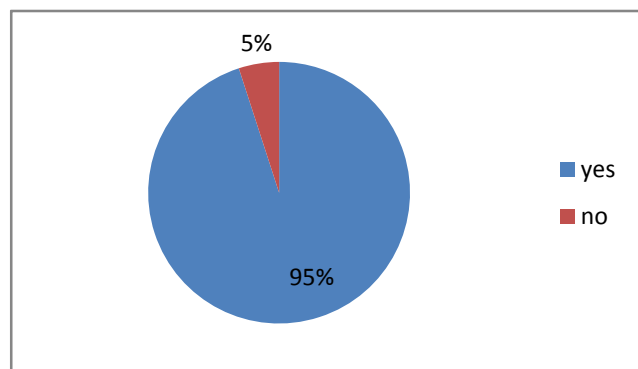


Figure 119 safety and security mechanism in IPT vehicles

**g. Reasons for usage of IPT other than Public transport**

This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

1. **Accessibility:** Nearly 70% respondents found IPT to be more accessible. The main reason being continuous availability of auto rickshaw whenever required at all locations.

However the rest 30% is of the opinion that due to routes being fixed no door to door services provided.

2. **Convenience:** Another characteristic associated with their preference was convenience. Around 74% respondents find IPT to be more convenient again for the main reason being its easy availability. Though again few users find it inconvenient as inter change has to be done to reach the final destination.

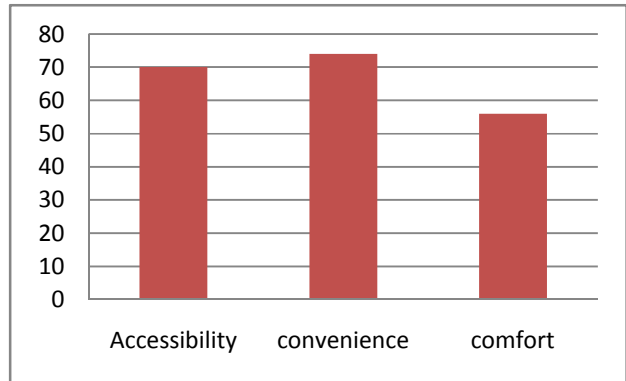


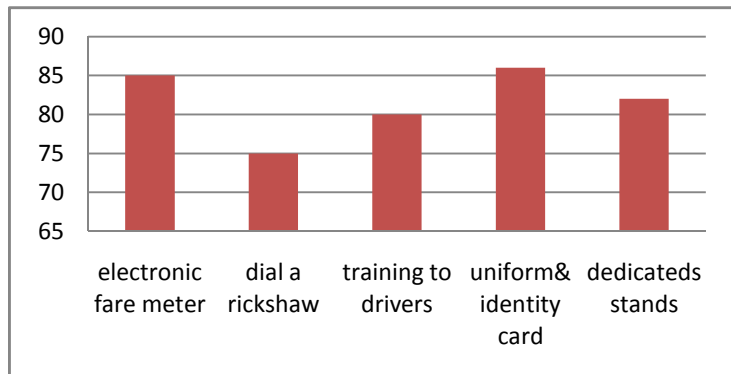
Figure 120 Reasons for usage of IPT

3. **Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus (in case of shuttle IPT), and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. However only 56% of the respondents in Surat said that it is comfortable. The low percentage is due to the shuttle service often over crowd the vehicles leading to dis comfort of passengers.

#### h. Other Suggestions for organizing services of IPT

1. Usage of modern technology- About 85% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.
2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 75% passengers are willing to use the services.

3. Training to drivers on road safety and driving skills were also agreed by about 80 % of the users. As the drivers often drive rashly according to passenger's perception.



**Figure 121 other suggestions**

4. 82 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion on busy roads.

5. About 86 % of users agreed that uniform dress code and identity card to all drivers make it safe for users using the service as lot of crime takes place in the city.

#### **i. Summary of findings from Users survey**

---

1. Charging of higher fares as the autos do not run on meters that are already installed in the vehicles.
2. Due to absence of dedicated auto rickshaw stands and parking areas often there is found chaos and congestion on roads.
3. Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services after evening.
4. Carriage of more passengers as compared to the design capacity of the rickshaws, leading to dis comfort of commuters.

# City Analysis- Guwahati

## City Profile - Background

Guwahati is the largest city of Assam and north eastern India. It is one of the fastest developing cities in India and is a major city in Eastern India, often referred as "Gateway of North Eastern Region" of the country.

Guwahati is the city with a population of 9.63 lakhs (2011 census). Guwahati is the major commercial and educational hub of North East India. The city is a major center for cultural activities and sports and for the administrative and political activities of Assam. The city is an important regional hub for transportation.

## Transport scenario

Currently the number of registered buses in Guwahati DTO is 5796. 1800 buses are being operated by private operators and 279 other buses are operated by Assam State Transport Corporation. Apart from city buses, rickshaws are also available from all major places and serves only around the city or some times between some localities only at a considerable price. Three-wheeler IPT are available on metered fare basis. There is no mass rapid transit system in Guwahati, although the authorities are planning for the same in future.

The total number of registered IPT in the city is approximately 9,000 (RTO Guwahati, 2012-2013). However the number of unregistered autos is also increasing as these often get support from political parties. Trip characteristics show that 18 % trips are made by walking, 13% by auto rickshaw, 30% by Public transport (PT) and around 31% by private motorized transport (Master Plan- 2025).

## IPT System

There is only one of IPT functioning in Guwahati City

### **Auto rickshaw (3 seater capacity) –**

These IPT are 3 seater, which run on personal basis. However IPT are not a very favorable mode of travel within the city, due to higher fares. These IPT run on routes fixed by District Transport Office according to areas. 5 such areas/centers have been identified for these IPT. Fares are charged by drivers on the basis of meter.

### **Regulatory bodies**

The District Transport Office (DTO) and City traffic police are the main authorities looking after the regulatory issues in the city. Though aware, of the system prevailing in the city, the authorities are not stringent about the violations.

### **Routes and fares**

The routes of IPT are fixed by the DTO. The route permits are given according to the 5 specific centers/zones fixed by the DTO. However within these centers or area the IPT can ply anywhere depending upon the availability of passengers and demand. Routes are not rationalized therefore often drivers do not get enough passengers and therefore the autos have to stand on road and add to the congestion levels.

The fare structure is fixed by the DTO by notification from the government. The fares are regularly revised depending on the rise in fuel prices. The starting fare is Rs 30 for the first two kilometers and Rs 15 with increase in per kilometer henceforth.

### **Issue of Permits and its renewal process**

The permit for IPT is issued by the DTO at a payment of Rs.500 along with the following documents:

- Filled application form to the Regional Transport Officer.
- Residence Proof
- Driving license
- Age proof

- Insurance certificate of vehicles

The time taken for processing is less than 15 days from the date of application. The permit is renewed after every 5 years at a payment of Rs 500.

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and motor vehicles Rules 1989.

### **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. Though rickshaw stands have been provided at 94 locations with their capacity specified from the Municipal Corporation. But these locations are currently inadequate and at many places inappropriate. Also these stands are often found to be blocked by encroachment. Therefore the IPT still queue up seeking passengers at major junctions, thus contributing to congestion levels. Also no workshops or repairing shops are provided for repair of IPT Vehicles.

### **Vehicle characteristics**

The vehicle running within the Municipal limits of the city of Guwahati is mainly petrol. About 70 % of vehicles are 2 stroke and only 30% are 4 stroke. Though conversions from 2 stroke to 4 stroke engines have taken place in many cities of India but in Guwahati no conversion has taken place.

### **Sample size for Auto rickshaw drivers and users survey**

Surveys were carried out for drivers and users of IPT in Guwahati city, 90 surveys for drivers and user surveys through random sampling method were conducted at important locations of Guwahati. Few of the busiest and non busiest routes were surveyed to get feedback from the drivers and users in the city. Survey locations in the city are: Railway stations, Cristian Basti stand, Power House –Kahilipara, Lokhra Road, Basistha Mnadir.

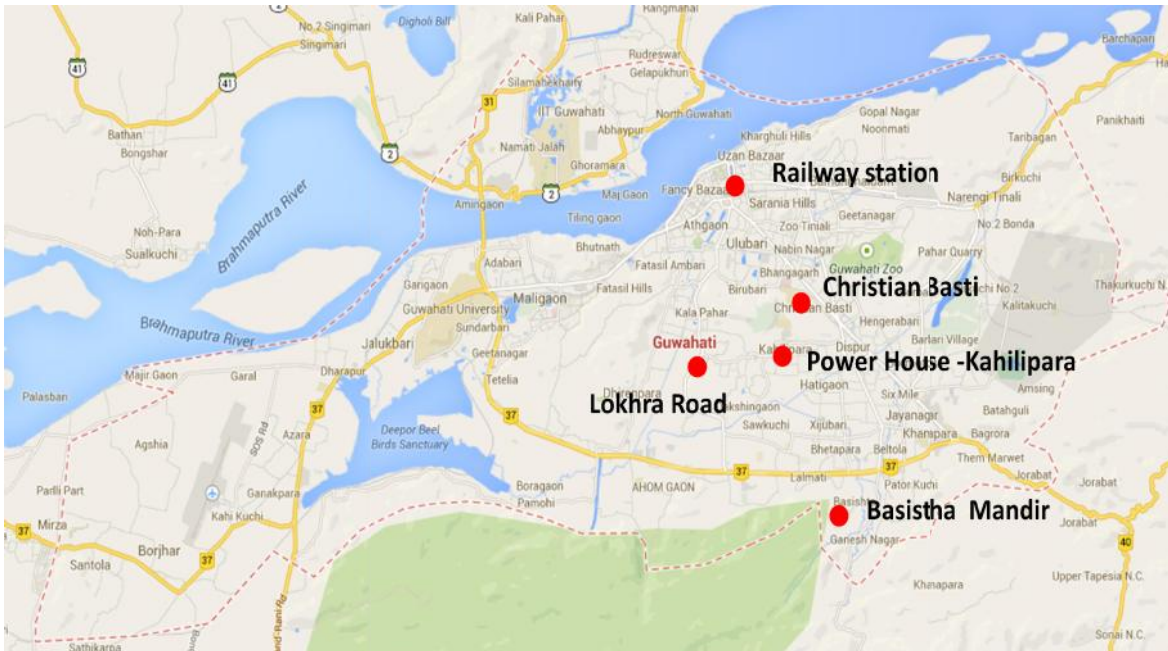


Figure 122 Survey Location

## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

### a. Ownership of Vehicles

About 65 % of the drivers surveyed at various locations of the city stated that they have rented the auto rickshaw they drive. Ownership in Guwahati is only 35 %. The main reason being that, they have not enough money to purchase an auto rickshaw

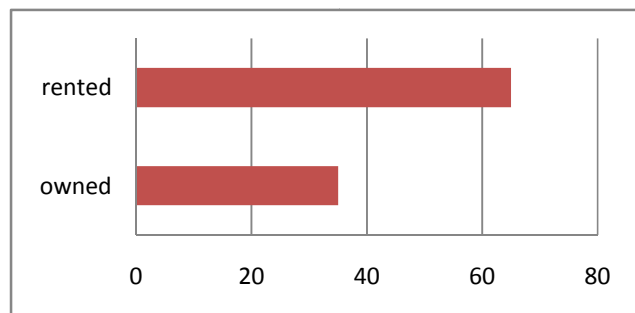


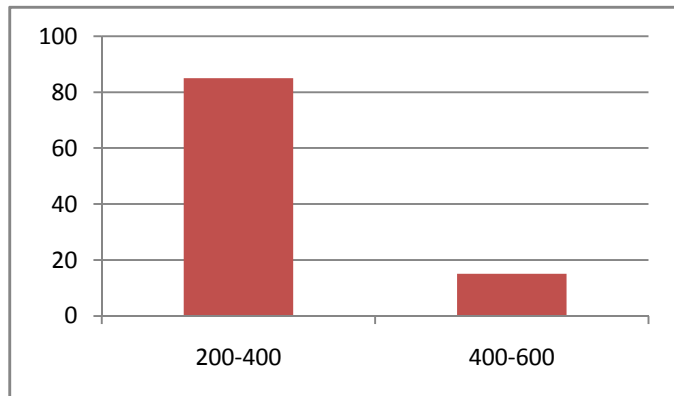
Figure 123 Ownership of vehicles

and purchasing an auto rickshaw through a loan from banks is a lengthy and a tedious process due to too much documentation required (Documents required are given in section g). It is also

observed that out of the owners majority owns about 3-4 IPT. Also the rent paid by the drivers to their owners on an average is Rs 150 daily.

**b. Revenue earned per day**

85 % the drivers stated that the revenue collected per day varies between Rs 200- Rs 400. The average earning per month is Rs 9000. Only about 15 % of drivers earning is between Rs 400- 600. The average income earned per month is therefore Rs 15,000. This is due to these



IPT are found near the bus stands or railway stations earns more. However the

**Figure 124 Revenue earned per day**

IPT that are rented have to pay on average of Rs 150 daily to their owners from the daily earnings. Other than fare box revenue few of the IPT has school permit and carry school children. These IPT charge per student an amount of Rs 1000 per month. At a maximum only three student are carried per trip. Also if IPT want they can advertise at the back of the rickshaws at Rs 50 per month. Comparative table showing earning of shuttle and general IPT are given below:

**Table 1 Revenue earned per month**

Descriptions		Earning per day	Average earning per month	Rent/day	Total earning per month
Income in case of rented IPT	<b>Private auto</b>	Rs 200- Rs 400	Rs 9000	Rs 150	Rs4,500
Income in case of owned IPT	<b>Private auto</b>	Rs 200- Rs 400	Rs 9000	-	Rs 9,000
Income in case of rented IPT near railway stations and airports	<b>Private services</b>	Rs400- Rs 600	Rs 15,000	Rs 150	Rs 10,500



Income in case of rented IPT near railway stations and airports	<b>Private services</b>	Rs400- Rs 600	Rs 15,000	-	Rs 15,000
Income in case of rented IPT+ school permits	<b>Private auto</b>	Rs 200- Rs 400+ Rs 100*	Rs 9000+ Rs 3,000= Rs 12,000	Rs 150	Rs 7,500
Income in case of owned IPT + school permits	<b>Private auto</b>	Rs 200- Rs 400+Rs 100*	Rs 9000+ Rs 3000= Rs12,000	-	Rs12,000
Income in case of rented IPT+ advertisement revenue	<b>Private auto</b>	Rs 200- Rs 400	Rs 9000+Rs 1500**=Rs 10,500	Rs 150	Rs 6000
Income in case of owned IPT+ advertisement revenue	<b>Private auto</b>	Rs 200- Rs 400	Rs 9000+ Rs 1500**= Rs 10,500	-	Rs 10,500
Income in case of rented IPT near railway stations and airports	<b>Private services</b>	Rs400- Rs 600	Rs 15,000+Rs 1500**=Rs 16,500	Rs 150	Rs 12,000
Income in case of rented IPT near railway stations and airports	<b>Private services</b>	Rs400- Rs 600	Rs 15,000+Rs 1500**=Rs 16,500	-	Rs16,500

\* Maximum of 3 students is carried according to permit given.

\*\* Advertisement revenue at the rate of Rs 50/month

### c. Average length travelled by auto per day

85 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms and 15 % stated that the average length travelled to be between 100-150 kms.

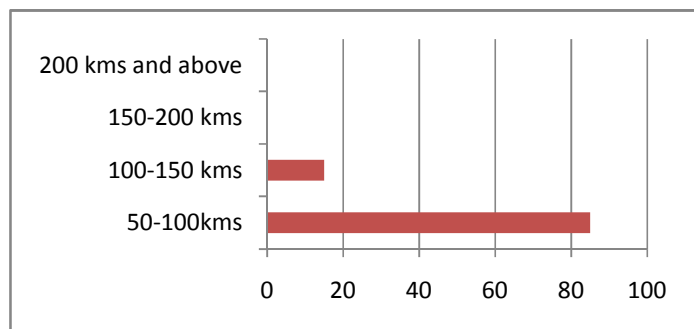


Figure 125 Average length travelled /auto/day

### d. Passengers travelled per day per auto

It is stated that about 95% of drivers carries not more than 10 passengers per auto per day, as it is not considered an affordable option by people when compared to other modes in the city.

**e. Funding Provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents required by the banks to finance the loan. Hence the driver feels it easy to resort to a

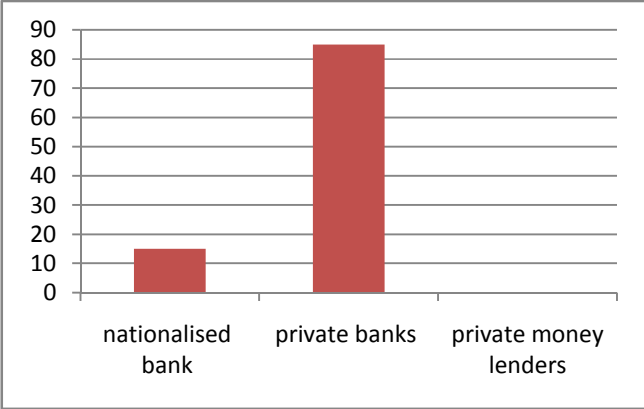
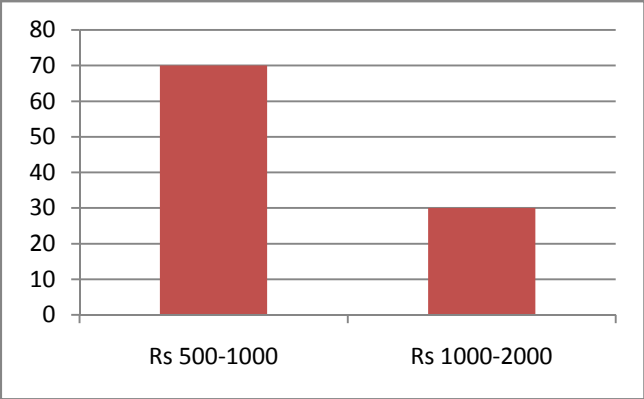


Figure 126 Financing IPT

private financier(mentioned in earlier chapters) even though the financier charges higher interest of 25% as compared to nationalised banks which charge 12.5%. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 85% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks even though it being a legal procedure.

**f. Maintenance cost of vehicles.**



About 70 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 500 to Rs 1000 (Average Rs 750/ month). Whereas only 30 % stated that the cost of maintenance of the vehicles per month is between Rs 1000-Rs 2000 (average Rs 1500 / month). The cost in the previous case is lower as maintenance cost of 2 stroke engines is lower than the maintenance cost of four stroke engines.

#### g. Other charges/bribes/penalties

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for not standing in designated parking areas and overcrowding on the roads leading to congestion. The fines charged for this ranges from Rs 300 to Rs 500. Only 5 % is found

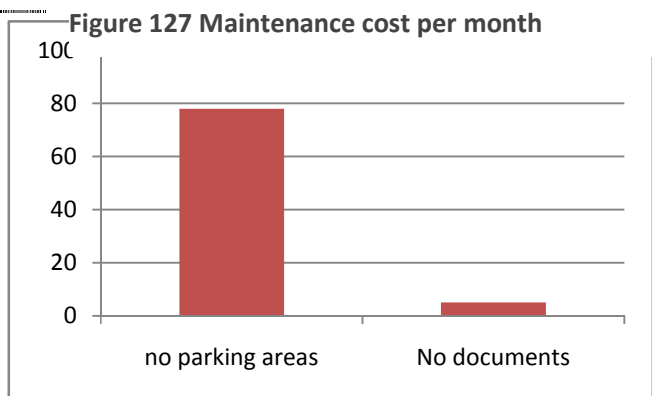


Figure 128 Reasons for bribes/penalties

without documents. No other reasons

were found for which the drivers were fined.

Table 2 Total income and expenditure of auto drivers.

Descriptions		Total earning per month (In Rs)	Maintenance cost/ month* (In Rs)	Bribes to traffic police/per month(Rs)	Total expenditure /month (in Rs)	Total revenue/ month (in Rs)
Income in case of rented IPT	Private auto	4,500	1,125	-	1,125	3,375
Income in case of owned IPT	Private auto	9,000	1,125	-	1,125	7,875
Income in case of rented IPT near railway stations and	Private services	10,500	1,125	-	1,125	9,375

airports						
Income in case of rented IPT near railway stations and airports	<b>Private services</b>	15,000	1,125	-	1,125	13,875
Income in case of rented IPT+ school permits	<b>Private</b>	7,500	1,125	-	1,125	6,375
Income in case of owned IPT + school permits	<b>Private auto</b>	12,000	1,125	-	1,125	10,875
Income in case of rented IPT+ advertisement revenue	<b>Private</b>	6000	1,125	-	1,825	4,875
Income in case of owned IPT+ advertisement revenue	<b>Private auto</b>	Rs 10,500	1,125	-	1,125	9,375
Income in case of rented IPT near railway stations and airports	<b>Private services</b>	Rs 12,000	1,125	-	1,125	10,875
Income in case of rented IPT near railway stations and airports	<b>Private services</b>	Rs16,500	1,125	-	1,125	15,375

\*average of maintenance cost per month taken

#### **h. Association with unions**

There are 4 registered trade unions for the IPT in Guwahati. The association is trying to sustain itself by suggesting benefits to auto rickshaw drivers in terms of healthcare facilities, insurance, finance for loans and sometimes by solving internal disputes between drivers/owners and by providing education facilities for their children. However, from the driver survey, when asked

the reason for being not associated with any such associations, the common answer got was that there is no such benefit as to be provided by these associations except to organize strikes

#### **i. Other problems**

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1. As per the driver's survey 80 % of the drivers have obtained primary education and 19 % secondary. Therefore the computerized driving test recently introduced by authorities becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, education facilities

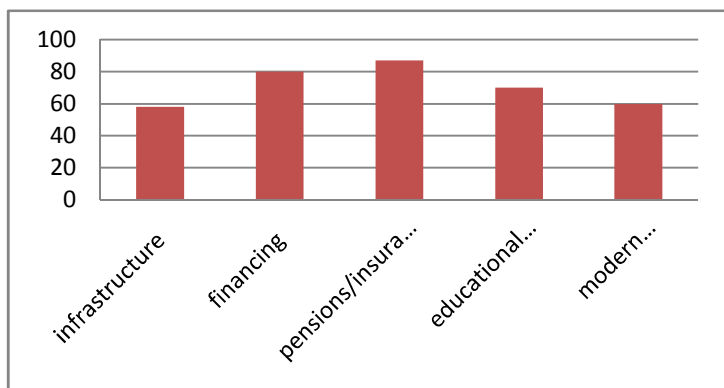
#### **j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

#### **Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 58% respondents in Guwahati suggested for provision of



**Figure 129 Suggestions for improvement**

auto rickshaw stands at appropriate locations and with appropriate capacities for their improvement which enables access to get passengers easily, which in turn would also reduce the hassles they have to deal with traffic police on daily basis for encroaching the roads while waiting for potential passengers at critical locations.

## **Financing**

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out daily rent which decreases their revenue earnings. Hence common criteria for both the auto rickshaw drivers and unions (80%) suggested that the financing procedure of IPT should be made easier. And also they suggested that it would be better if government comes up with beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

## **Pensions/Insurance**

An auto rickshaw driver feels that though it is a business, in a way he is doing a public service, and so he should be offered benefits in terms of government scheme pensions so that he does not feel insecurity for his future. 70% respondents in Guwahati feel that they should be given pension/insurance for their future security.

## **Training Programmes:**

About 70 % of respondents in Guwahati agreed to undergo training and educational training programmes for providing better service to customers.

## **Usage of modern technology**

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then 60 % of the drivers suggested for such improvement to be added. The rest are of the opinion that if subsidies or of free cost the GPS is given by government then such technology could be added.

## **k. Summary of findings from drivers survey**

---

1. Auto rickshaw driver on an average earns Rs. 200- 400 per day which does not enable him to provide a better future to his family (Refer table1 and 2). Also the earning from rented IPT is lower than owned rickshaws. However the autos doing dual work like working with school permit and passenger's movement permit earn more compared to the normal IPT. Also the IPT running as taxis near railway stations and airports earn more. It is also observed that 3 wheeler autos drivers that operate as private or shuttle services do not even earn the minimum wages as fixed by the Labour Welfare Department of Assam (Rs 6810 per month).Therefore these are said to be the worse sufferers.
2. Lack of proper infrastructure facilities like auto stands (though provided are at in appropriate locations and also no enforcement), parking areas, workshops for repairs etc.
3. Strong enforcement levels of traffic rules and registration of IPT by the DTO will lead to better earning of the drivers and removal of unregistered IPT from the city.
4. Routes are not rationalized therefore often drivers do not find enough passengers.
5. Due to the use of petrol in the engines the fuel efficiency levels are also low. It is about 20- 25 km compared to CNG (more than 30- 35 kms) and also adding to higher levels of pollution and greater maintenance cost.
6. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 25%.But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.

7. Since the educational levels are lower therefore computerized driving test that is recently introduced are not possible to be given by drivers.
8. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.

## Users survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 88 users on the basis of random sampling was carried out, at various locations. by selecting various characteristics that they associate with this IPT mode

### a. Age group of users

From the survey it has been observed that all age groups of people use the IPT services. 5 % belongs to the age group of less than 20 years. 27 % belongs to the age group between 20- 30 years, 37% of the surveyed users belong to the age group of 30 to 40 years. Above the age group of 40, 30 % use the IPT, as it provides door to door services for elderly citizens. Young population is mostly the users of the system.

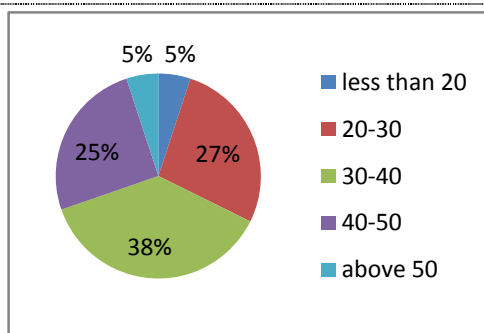


Figure 130 age profile of users

### b. Occupation of users

From the survey it is observed that 10 % belongs to business class, 13 % to industrial sectors, private( 45%) and students ( 16%) and house wife is 14%. Government accounts for the least (2%).

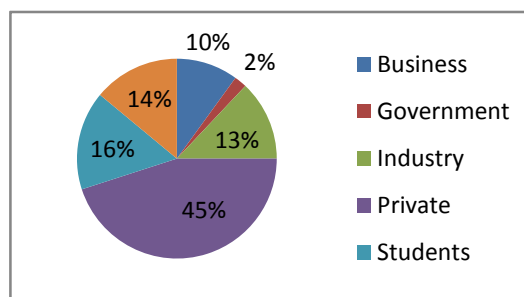


Figure 131 Occupation



**c. Purpose of trip by IPT**

It has been observed that 51 % of the trip purposes for which these IPT services are used are for work purpose and 29% for social purpose and 20 % for educational trips.

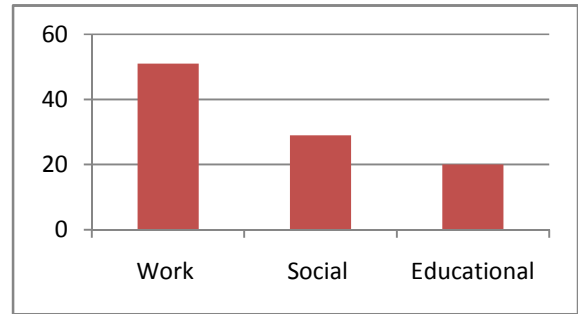


Figure 132 Trip purpose

**d. Average distance travelled by passengers**

It has been observed that 54% of users travel by the IPT for not more than 5 kms. However about 46 % of the users travel more than distance of 5 kms and above, as some population also migrates to the nearby industrial areas.

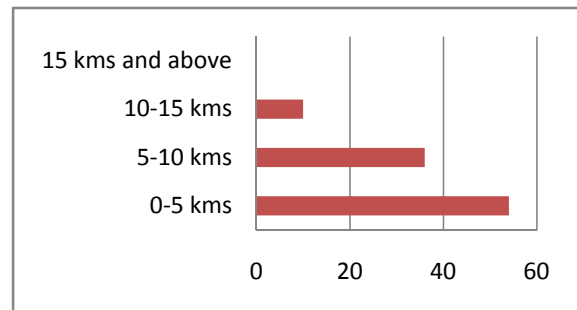


Figure 133 Average distance travelled by users

**e. Expenditure per month**

From the survey it has been observed that only 20 % of users spend monthly of less than Rs 500 for using IPT services. However 80 % spends between Rs 500. The spending in IPT is higher as the fares are higher.

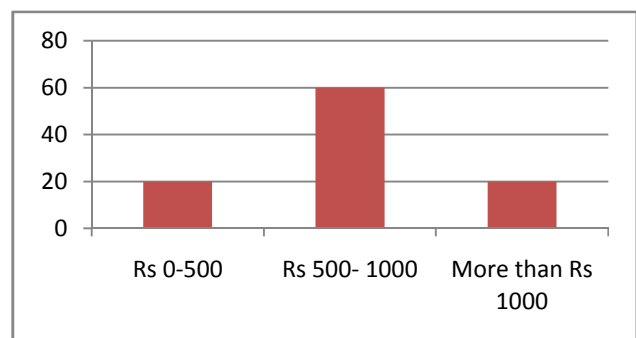


Figure 134 Expenditure per month

#### f. Safety and Security

It has been stated that 69% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore very high.

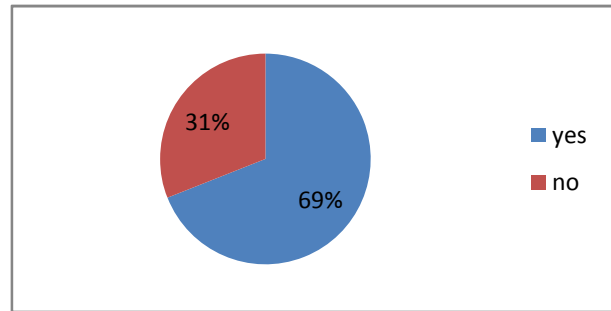


Figure 135 safety and security mechanism in IPT vehicles

#### g. Reasons for usage of IPT other than Public transport

This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

1. **Accessibility:** Nearly 60% respondents found IPT to be more accessible. The main reason being continuous availability of auto rickshaw whenever required at all locations. However the rest 30% is of the opinion that they have to fetch the rickshaws to the stand as the stand are not at appropriate locations.

2. **Convenience:** Another characteristic associated with their preference was convenience. Around 74% respondents find IPT to be more convenient again for the main reason being its easy availability.

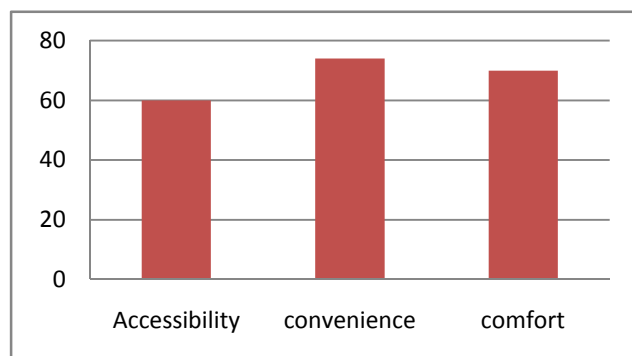


Figure 136 Reasons for usage of IPT

3. **Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus (in case of shuttle IPT), and easy availability

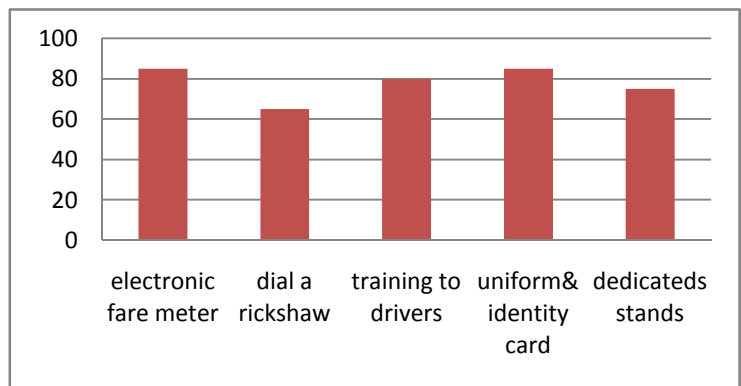
and connectivity are main characteristics for comfort associated with the auto rickshaw. However 70% of the respondents in Guwahati said that it is comfortable.

#### **h. Other Suggestions for organizing services of IPT**

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1. Usage of modern technology- About 85% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers can charge the commuters reasonably.

2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 65% passengers are willing to use the services. Other are not willing as they are not ready to shelve out money from their own pockets.



**Figure 137 other suggestions**

3. Training to drivers on road

safety and driving skills were also agreed by about 80 % of the users. As the drivers often drive rashly according to passenger's perception.

4. 75 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion on busy roads.

5. About 85 % of users agreed that uniform dress code and identity card to all drivers make it safe for users using the service as lot of crime takes place in the city.

#### **i. Summary of findings from Users survey**

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1. Higher fares are charged to the commuters though rates are fixed by the notification of government.

2. Though auto rickshaw stands have been provided but these are at in appropriate locations and without sufficient capacities leading to chaos and congestion on roads. Therefore proper enforcement is required from authorities.
3. Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services after evening.

# City Analysis- Luck now

## City Profile - Background

Lucknow is the capital of Uttar Pradesh. It is a metropolitan city and is one of the fastest growing city of India. It has a population of 30,37,718 (Census, 2011).

## Transport scenario

There are a wide variety of transport modes used in Lucknow. Cars, 2 wheelers. Bicycles. IPT, Cycle rickshaws, city bus service LMPS under UPSRTC (initiated in 2005 with fleet of 300 buses) are used to meet daily travel needs of the residents of Lucknow. Also metro rail service is proposed for the future. City bus system is not strong in Lucknow. The total number of registered IPT in the city is approximately 2575 (RTO Lucknow 2012-13). In Lucknow NMT has 41% of mode share, PT/Shared Auto has 10 % of mode share, 2 wheeler has 42% of mode share and 5 % of mode share is of car/vans (Lucknow Metro DPR 2009).

## IPT System

There are 2 types of IPT functioning in Lucknow City

### **Auto rickshaw (3 seater capacity) –**

In Lucknow auto-rickshaws operate as shared basis. These are operated on main routes of the city however these can operate on any route of city 3 seater capacity IPT also ply as “shuttles” in some areas accommodating more than 3 passengers to even 6 passengers as an illegal practice, charging Rs. 5 – 24 from one stop to another. On major transit stops like at railway stations and bus stations prepaid auto rickshaw service is available. An inefficient public transport service has created a huge gap in demand and supply. This gap is filled by these IPT.

### **Vikram /Tempos (8 seater capacity) –**

These types of taxis are commonly known as “Tempo” and are larger vehicles than the usual 3 seater auto rickshaw. They generally operate as shuttle auto service on a pre-decided fixed fare basis, charging on an average Rs. 5 -7 from one stop to another. They ply on fixed routes as point to point service. However, operating as shuttles, they generally seat 8 – 10 passengers and operate illegally. These type of shuttle services operate throughout the day. Their stands are fixed and they cannot stop at any location on their route.

### **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city. Though aware, of the shuttle system prevailing in the city, the authorities are not stringent about the violations.

### **Routes and fares**

The routes of IPT are not fixed by the RTO but routes of Vikrams are fixed by RTO. The fare structure is fixed by the RTO by notification from the government on basis of rise in fuel prices. Fares are regularly revised at a period of 1 year. Shared IPT are available throughout the city. The minimum fare is Rs 5/- during day and night. However the 3 seater IPT though does not have any fixed route from the RTO, still follows a fixed route pattern decided from the union and pre fixed fare structure, charging Rs 5-7 per passenger. The 6 seater vikrams act more as a substitute of public transport at few locations in the city. These are mostly found on the old area and outskirts of the city.

### **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.1000 along with registration fees of Rs. 300/-. The following documents are needed at the time of registration:

- Filled PCOP form (application form) to the Regional Transport Officer.
- Residence Proof
- Minimum 8th standard Pass certificate

- Court stamp Rs.10 Rupee
- Driving license
- Fitness certificate
- Insurance - vehicle insurance
- Pollution under control certificate.
- Meter No / Bill. Meter should be compulsory
- Permit fee

The time taken for processing is less than 15 days from the date of application. The permit is renewed after every 5 years at a payment of Rs 300.

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act and the Uttar Pradesh state Act.

### **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. Though IPT stands and few dedicated tracks have been provided by Municipal Corporation at few locations of the city, but they are currently inadequate and at many places inappropriate. Also these are blocked by encroachment. Therefore IPT still queue up seeking potential passengers at critical junctions, thus contributing to congestion levels. Also no workshops or repairing shops are provided for repair of IPT Vehicles.

### **Vehicle characteristics**

The 3 seater auto rickshaw within the city limits of Luck now has CNG 4 stroke engines (44%) while the vikrams CNG 2-stroke(56%). 2 stroke engines are still in use in the city because the average maintenance cost per month in case of auto rickshaw 4 stroke engines is Rs 3750 whereas the average maintenance cost of vikrams 2 stroke engine is Rs. 2000.

### **Sample size for Auto rickshaw drivers and users survey**

Surveys were carried out for drivers and users of IPT in Lucknow city, 70 surveys for drivers and 70 user surveys through random sampling method were conducted at important locations of Lucknow, for the research purpose. Survey locations were selected according to major locations where presence of IPT and its movement and on some of the busiest areas like Charbagh Railway Station, Alambagh bus Station, Munshi Pulia, Nishatganj.



Figure 138 Survey Locations

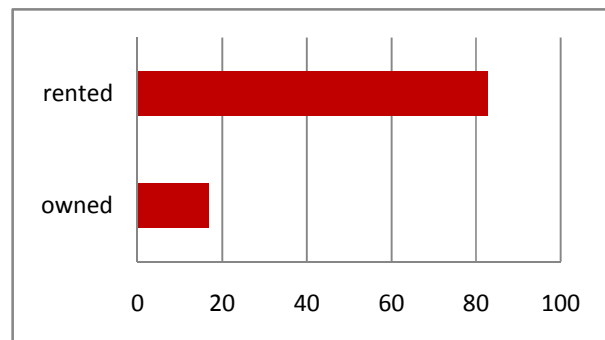


## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

### a. Ownership of Vehicles

About 83% of the drivers surveyed at various locations of the city stated that they have rented the auto rickshaw they drive. Ownership in Lucknow is 17%. The main reason being that, they have not enough money to purchase an auto rickshaw and



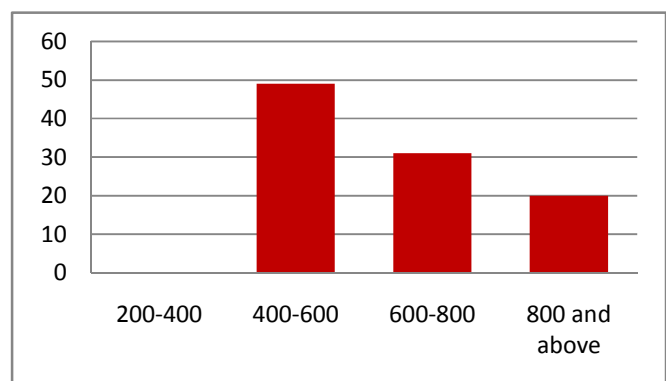
purchasing an auto rickshaw through a loan from

banks is a lengthy and a tedious process due to **Figure 139 Ownership of vehicles**

too much documentation required (Documents required are given in section g). It is also observed that out of the owners majority owns about 1- 5 IPT and few own more than 5 IPT. Also the rent paid by the drivers to their owners ranges from Rs 400- Rs 500 daily.

### b. Revenue earned per day

About 49% of the drivers said that the revenue collected per day varies between Rs 400 to Rs 600. The average income earned per month is therefore Rs 15,000. About 31% of the drivers said that revenue collected per day varies between Rs. 600 – Rs. 800. The average earning per month is Rs. 21000. About 20% of the drivers said that revenue collected



**Figure 140 Revenue earned per day**

per day varies between Rs. 800 – Rs. 1000. The average income earned per month is therefore Rs 15,000. The main reason for such variation in revenue collection is because the shuttle

services carries illegally greater number of passengers compared to the actual design of vehicles and also these drivers charge more fares from users as these services are mostly present in areas where there is absence of public transport. However the IPT that are rented have to pay an amount of Rs Rs. 300 in case of 8 hrs shift to Rs.500 per day (12 hrs shift) depending upon the condition of rickshaw to their owners from the daily earnings. Comparative table showing earning of IPT are given below:

**Table 3 A. Revenue earned per month for 8 hrs. shift**

Descriptions		Earning per day (8 Hrs shift)	Average earning per month	Rent/day (8 Hrs shift)	Total Earning per month
<b>Auto-Rickshaw</b>	Rented	400-600	15000	300	6000
	Owned	400-600	15000	--	15000
	Rented	600-800	21000	300	12000
	Owned	600-800	21000	--	21000
<b>Vikram/Tempo</b>	Rented	600-800	21000	500	6000
	Owned	600-800	21000	--	21000
	Rented	800-1000	27000	500	12000
	Owned	800-1000	27000	--	27000

**Table1B: Revenue earned per month for 12 hrs. shift**

Descriptions		Earning per day (12 Hrs shift)	Average earning per month	Rent/day (12 Hrs shift)	Total earning per month
<b>Auto-Rickshaw</b>	Rented	600-800	21000	450	7500
	Owned	600-800	21000	--	21000
	Rented	800-1000	27000	450	14000
	Owned	800-1000	27000	--	27000

**c. Average length travelled by auto per day**

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About 47 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms and only 23 % stated that the average length travelled to be between 100-150 kms. About 10% stated that the average length travelled to be between 150-200 kms.

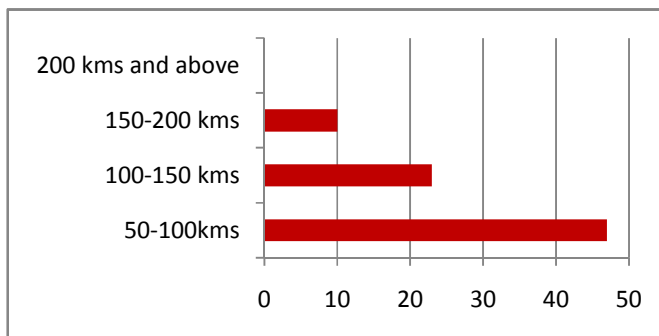


Figure 141: Average length travelled /auto/day

**d. Passengers travelled per day per auto**

It is stated that about 68% of drivers carries not more than 40 passengers per auto per day. 32 % of drivers states that they carry between 40-80 passengers per auto per day. This difference is due to overloading of auto-rickshaws which is illegal.

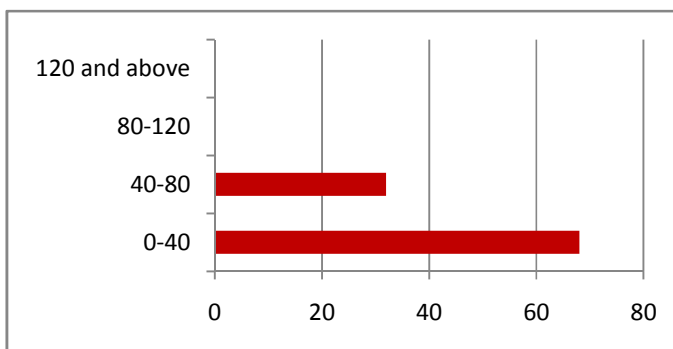


Figure 142: Passengers travelled per day per auto

**e. Funding Provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents (mentioned in earlier chapters). Required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier(mentioned earlier in chapters) even though the financier charges higher interest of 16 -24% as compared to nationalised banks which charge from 11- 14%. Some of the common financiers are Dena bank, Bank of India, HDFC bank, Canara bank and other private lenders etc. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. About 55% resort to private banks, 35% by money lenders and 10% by nationalised banks

**f. Maintenance cost of vehicles.**

About 47 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 1000 to Rs 2000 (Average Rs 1500/month). Whereas only 36 % stated that the cost of maintenance of the vehicles per month is between Rs 3500-Rs 4000(average Rs 3750 / month).The cost in the latter is higher as maintenance cost

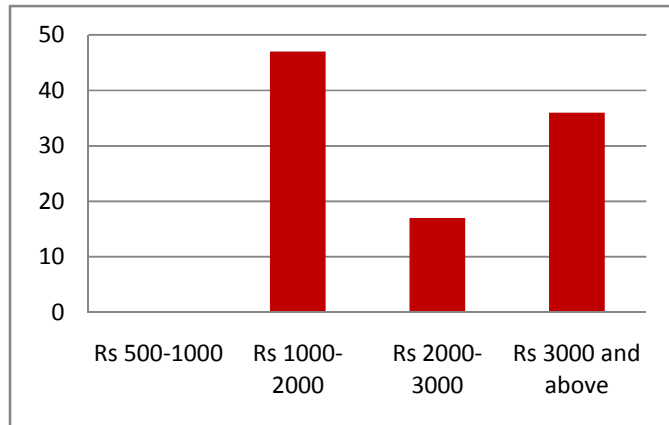


Figure 143 Maintenance cost per month

of 4 stroke engines are higher. About 17% of the drivers said that the cost of maintenance of the vehicles per month is between Rs. 2000. Driver bears maximum maintenance cost of Rs. 50/day in case of rented IPT and vikrams.

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO’s mainly for traffic rule violations. The major cause for fines as found from the driver survey was overcrowding in case of shuttle operations. The other causes found out were not having adequate documents as required.

However, the traffic penalties are often converted into a source of bribe by the city traffic officials. The illegal shuttle operations has been found in the Lucknow city area, as per the driver survey states that about 30% drivers pay an amount of Rs.50-Rs.100 (Average Rs. 75) to the traffic police per day in order to keep their operations running.

**Table 2A Total income and expenditure of auto drivers (8 hrs shift)**

Descriptions		Total Earning per month (Rs.)	Maintenance cost/month (Rs.)	Bribes to traffic police	Total Expenditure (Rs.)	Total Revenue/month (Rs.)
Auto-Rickshaw	Rented	6000	1500	2250	3750	2250
	Owned	15000	3750	2250	6000	9000
	Rented	12000	1500	2250	3750	8250
	Owned	21000	3750	2250	6000	15000
Vikram	Rented	6000	1500	2250	3750	2250
	Owned	21000	2000	2250	4250	16750
	Rented	12000	1500	2250	3750	8250
	Owned	27000	2000	2250	4250	22750

\*average of maintenance cost per month taken

**Table 2B Total income and expenditure of auto drivers (12 hrs shift)**

Descriptions		Total Earning per month (Rs.)	Maintenance cost/month (Rs.)	Bribes to traffic police	Total Expenditure (Rs.)	Total Revenue/month (Rs.)
Auto-Rickshaw	Rented	7500	1500	2250	3750	3750
	Owned	21000	3750	2250	6000	15000
	Rented	14000	1500	2250	3750	10250
	Owned	27000	3750	2250	6000	21000

#### **h. Association with unions**

There are around 27 unions in Lucknow, out of which only 2 are registered and work actively. The association is trying to sustain itself by suggesting benefits to auto rickshaw drivers in terms of healthcare facilities, insurance, and education facilities for their children. However, from the driver survey, when asked the reason for being not associated with any such associations, the common answer got was that there is no such benefit as to be provided by these unions.

### **i. Other problems**

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1. As per the driver's survey 79% of the drivers have obtained primary education or are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, education facilities

### **j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

#### **Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 90% respondents in Lucknow suggested for provision of auto rickshaw stands at appropriate locations for their improvement which enables access to get passengers easily, which in turn would also reduce the hassles they have to deal with traffic police on daily basis for encroaching the roads while waiting for potential passengers at critical locations.

#### **Financing**

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out daily rent which decreases their revenue earnings. Hence a common criteria that both the auto rickshaw drivers and unions (82%) suggested that the legal financing procedure of IPT should be made easier. And also they suggested that it would be better if government comes up with beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

### Pensions/Insurance

An auto rickshaw driver feels that though it is a business, in a way he is doing a public service, and so he should be offered benefits in terms of government scheme pensions so that he does not feel insecurity for his future.

80% respondents in Lucknow feel that they should be given

pension/insurance for their future security.

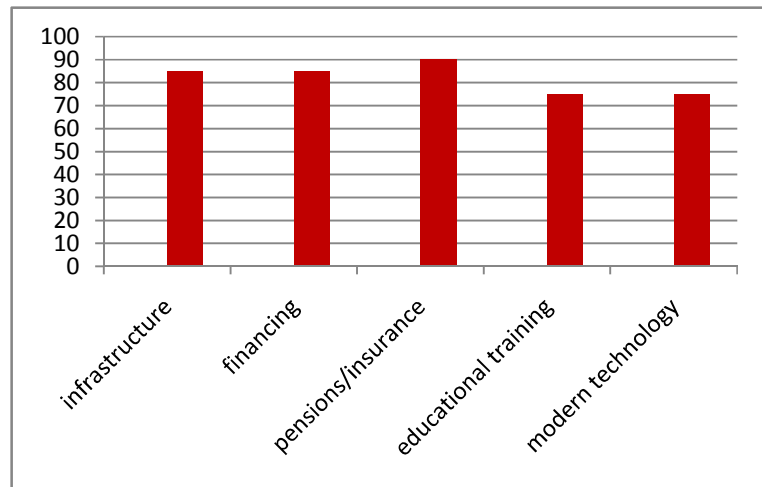


Figure 144 Suggestions for improvement

### Training Programmes:

About 75% of respondents in Lucknow agreed to undergo training and educational training programmes for providing better service to customers.

### Usage of modern technology

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then 65% of the drivers suggested for such improvement to be added.

### k. Summary of findings from drivers survey

---

1. A general auto rickshaw driver on an average earns Rs. 400- Rs. 600 per day which does and Rs 600- Rs 800 for vikrams/tempo services which does not enable him to provide a better future to his family (Refer table1a-b and 2a-b). Also the earning from rented IPT is lower than owned rickshaws. It is also observed that most of the auto rickshaw and vikram drivers do not even earn the minimum wages as fixed by the Labour Welfare

Department of Uttar Pradesh ( Rs 9000 per month). Therefore these are said to be the worse sufferers.

2. It is also seen from the above study that maintenance cost is higher for four stroke engines ( average Rs 3750 per month) compared to 2 stroke engines(average Rs 2000 per month), therefore do not prefer to convert their vehicles to 4 stroke.
3. Lack of proper infrastructure facilities like auto stands, parking areas, workshops for repairs etc.
4. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 16-24%.But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers loose their source of income.
5. Since the educational levels are lower therefore computerized driving test are not possible to be given.
6. No training or personal benefits like education, house, medical facilities are given to drivers from the government side or by the unions.

### **Users survey**

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 70 users on the basis of random sampling was carried out, at various locations. By selecting various characteristics that they associate with this IPT mode



**a. Age group of users**

From the survey it has been observed that all age groups of people use the IPT services. About 31% of the surveyed users belong to the age group of less than 20 years. About 24 % belongs to the age group between 20- 30 years. About 19% of the users belongs to age group between 30-40 years. Above the age group of 40, 16 % use the IPT.

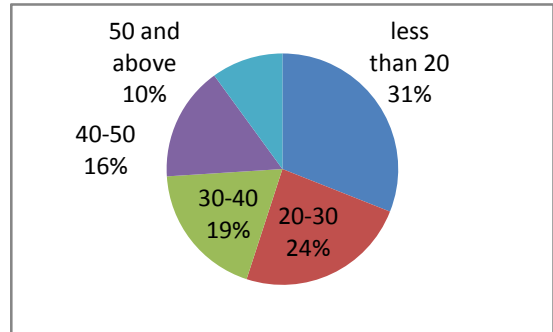


Figure 145: Age profile of users

**b. Occupations of users**

From the survey it is observed that more than 40 % of the users belong to the students and housewife category. About 34% of the users belong to private firms, NGOs and business class. About 21 % of the government uses IPT services.

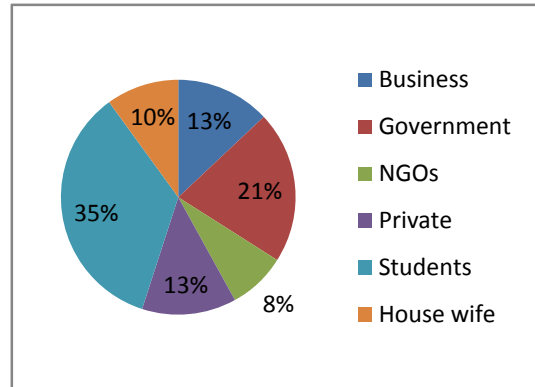


Figure 146 Occupation

**c. Purpose of trip by IPT**

It has been observed that 46 % of the trip purposes for which these IPT services are used are for work purpose and 31% for educational purpose. Only 23% uses for social trips.

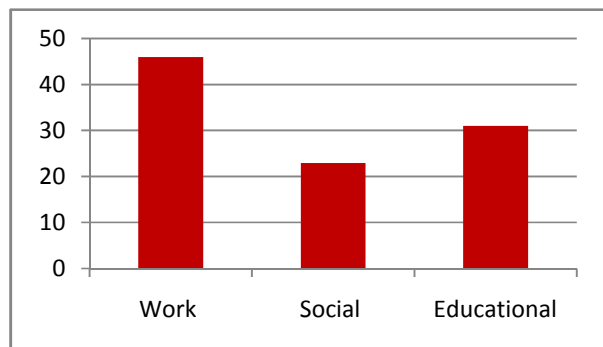


Figure 147 Trip purpose

**d. Average distance travelled by passengers**

It has been observed that majority (84%) of users travel by the IPT are for small to medium distance trips of not more than 10 kms. However about 16% of the users travel more than distance of 10 kms and above.

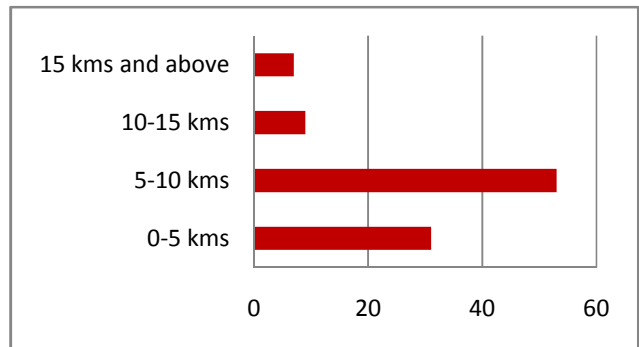


Figure 148 Average distance travelled by users

**e. Expenditure per month**

From the survey it has been observed that about 82 % of users spend monthly of not more than Rs 1000 for using IPT services. However, only 18 % spends more than Rs 1000. This 18 % people were found to travel more distance as a result more money is spend on IPT.

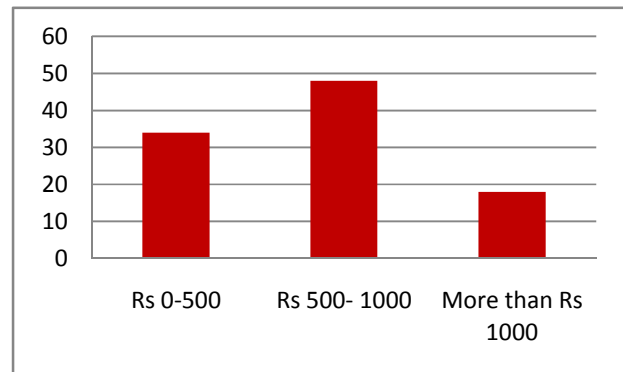


Figure 149 Expenditure per month

**f. Safety and Security**

It has been stated that 71% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore very high. Overloading, over-speeding and rash driving are the main reasons of users dissatisfaction.

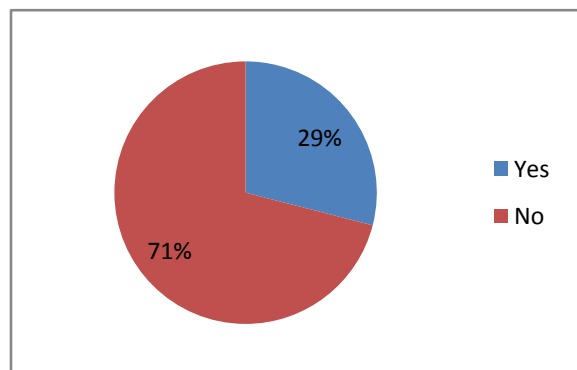


Figure 150 safety and security mechanism in IPT vehicles

**g. Reasons for usage of IPT other than Public transport**

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This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

**1. Accessibility:** Nearly 85% respondents found IPT to be more accessible. The main reason being continuous availability of auto rickshaw whenever required at all major locations.

**2. Convenience:** Another characteristic associated with their preference was convenience. Around 90% respondents find IPT to be more convenient again for the main reason being its easy availability. They run on major routes of the city on shared basis.

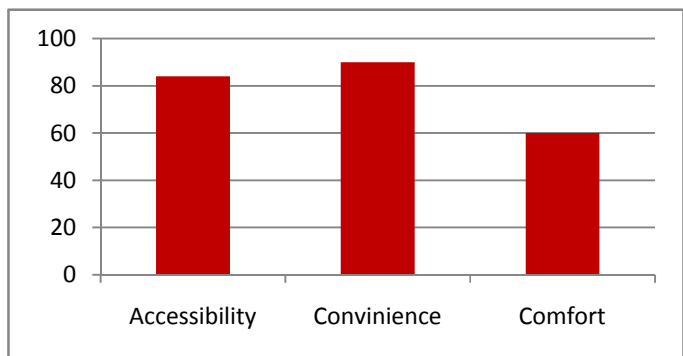


Figure 151 Reasons for usage of IPT

Also it provides the last mile / very near to last mile connectivity, and can be also opted for exact origin to destination connectivity, which makes their overall journey very convenient when compared to public transport where they are required to walk and wait for the bus availability at the stop which are many times not designed properly. Also they are required to make mode interchanges at times to reach their destination which they find inconvenient.

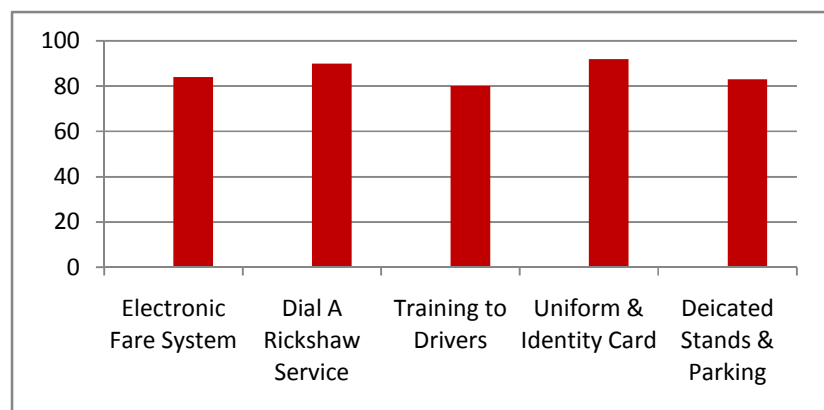
**3. Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus (in case of shuttle IPT), and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. 75% of the respondents using Lucknow shared auto and vikram said that it is comfortable. However about 25% of the shuttle service users complain of dis comfort as more passengers are illegally carried.

**h. Other Suggestions for organizing services of IPT**

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1. Usage of modern technology- About 84% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.
2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 90% passengers are willing to use the services.
3. Training to drivers on road safety and driving skills were also agreed by about 80 % of the users. As the drivers often drive rashly according to passenger's perception.

4. 92 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion on busy roads.



5. About 83 % of users agreed that uniform dress code and identity card to all drivers make it safe for users using the service as lot of crime takes place in the city.

Figure 152 other suggestions

#### i. Summary of findings from Users survey

1. Charging of higher fares as the auto rickshaw drivers ask for higher charges than fixed charges leading to dispute between users and drivers
2. Due to absence of dedicated auto rickshaw stands and parking areas often there is found chaos and congestion on roads.
3. Safety and security mechanisms are missing therefore the users specially females do not feel safe to use the services after evening.

4. Drivers are not trained so that they do rash driving, over speeding and overloading of passengers which creates safety concerns in the users.

# City Analysis- Jodhpur

## City Profile – Background

Jodhpur is the second largest and a metropolitan city in the Indian state of Rajasthan. The city is known as the "Sun City" for the bright, sunny weather it enjoys all the year round. It has a population of 1,137,815 as per the 2011 census.

## Transport Scenario

There are wide varieties of transport modes used in Jodhpur – cars, two wheelers, taxis, IPT, city bus service under the state government, to meet the daily needs of mobility from one place to another. But the increasing travel demand with increasing economy has aggravated the pressure on the existing infrastructure leading to the problems congestion and traffic mismanagement.

The total number of registered IPT (both shared and private) in Jodhpur is approximately 7570 (RTO, Jodhpur, 2013). The modal share for the city of Jodhpur comprises of 19.5 % of cars, 46.5% of two wheelers, 25% of IPT, 1% taxis and 8% of buses. (CMP, Jodhpur by Wilber Smith, 2010).

## IPT System

The type of IPT functioning in the city of Jodhpur is:

### **Auto Rickshaw (3 seater capacity) –**

This type of auto rickshaw is the commonly found auto rickshaw which operates as a contract carriage service with no fixed route and can ply anywhere within the city as per the need of the passenger. These are meter fitted IPT which are generally used by the passengers as a quick mode of connectivity from one place to another in the absence of private vehicles. These also

serve in areas of absence of Public Transport. The auto rickshaw charge Rs 15 per kilometer for the initial start meter and then charges Rs 9 for every increase in kilometer.

### **Tata Magic (8 seater capacity) –**

The city authorities in order to scrap the polluting vehicles like the tempos and vikrams have introduced Tata Magic which are diesel operated 4 stroke vehicles. This type of auto rickshaw is the one which operates on shared basis from one destination to another in the city on pre-decided routes by the MRTA (Member of Regional Transport Authority) under the RTO. These vehicles are 8 seater and at times during peak hour carries more than 8 passengers. These vehicles charge about Rs 5 – Rs 10 per passenger.

### **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city.

### **Routes and fares**

The routes of 8 seater Tata Magic are fixed by the RTO. At present, there are 13 defined routes on which these vehicles are plying. Out of these 13 routes, fleet of 2 routes is not fixed. The fleet is also fixed by the RTO; about 870 permits are issued for these routes. On these defined routes, the fleet size can vary according to the demand on each route. The fleet size varies between 3 to 127. However, the routes of 3 seater IPT are not fixed and can ply anywhere within the city.

The fares for both 3 seater auto rickshaw and 8 seater Tata Magic are fixed by the Secretary under the RTO. The IPT are metered with Rs 15/ km as initial charge and with increase in every kilometer Rs 9 is charged. There is a waiting charge of 50 paisa/ min and luggage charge of Rs 5/kg if the luggage is more than the prescribed limit of 10 kg. The fare for Tata Magic varies from Rs 5 to Rs 10. The last revision of fares was done 3 years back. Though fares are fixed from the RTO and meters are installed on vehicles but none follows the meter.

## **Issue of permits and its renewal process**

The permit for auto rickshaw and Tata Magic are issued by the RTO at a fee of Rs200 and Rs 275 respectively along with the following documents:

- Residence Proof
- Insurance certificate
- Vehicle Fitness certificate
- Pollution Under control certificate(PUCC)
- Driving License

The time taken for processing is less than 15 days from the date of application. The permit is renewed after every 5 years at a payment of same fees that is of getting a new permit. Penalties are charged according to the days of delay in the renewal process.

## **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 198 8 and Rajasthan State Motor Vehicles Rules 1989.

## **Infrastructure for IPT**

Keeping in view the rapidly increasing flow of traffic in the Jodhpur city, the Nagar Nigam and traffic police has notified 260 auto rickshaw stands with specified number of vehicles at each stand. But these notifications are not followed strictly by the auto rickshaw drivers and unauthorized parking of these IPT can be seen in the city.

## **Vehicle characteristics**

In order to remove the polluting and noisy vikrams and tempos, the city authorities have launched Tata Magic in the city with total fleet size of 870. These are diesel operated 4 stroke vehicles following the BS III emission norms. About 26% of IPT are operating on LPG and 74% on diesel following the Euro IV and Euro III emission standards respectively.

## **Sample size for auto rickshaw drivers and user survey**

Surveys were carried out for drivers and users of IPT in Jodhpur city. 75 surveys for drivers and users were conducted through random sampling method at some of the busiest routes fixed for the Tata magic and the locations of normal autos and also few non busy routes which mainly



confined to normal autos. Some of the survey locations are Jodhpur Railway station, Airport, Pratap nagar bus stand, Umaidbhawan, Chaupsani housing board and Nayapura hospital.



Figure 153 : Survey location

## Driver Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the city.

### a. Ownership of Vehicles

About 72% of the drivers surveyed at various locations of the city stated that they have rented their three wheeler and Tata Magic they drive. Owned is 28% only. The main reason being that they do not have enough money to purchase an auto rickshaw and purchasing an auto rickshaw through a loan from the bank is a lengthy

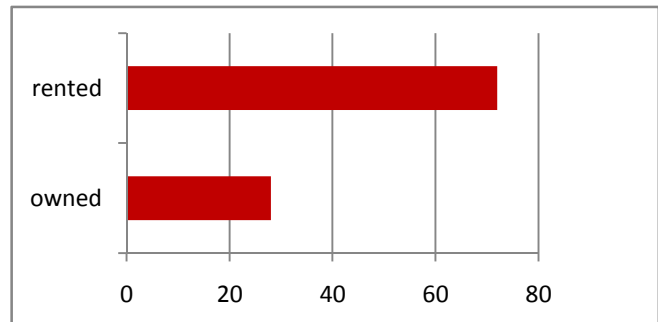


Figure 154 Ownership of vehicles

process due to much of documentation required (as mentioned in previous chapters). It is also observed that majority of the owners own about 1 to 4 IPT. The rent paid by the Tata magic drivers are Rs 250 per day whereas the drivers of 3 seater IPT pay 120 per day.

### b. Revenue earned per day

In case of 3 wheeler IPT, 65% of the drivers stated that the revenue collected per day varies from Rs 200 to Rs 400. The average earning per month is approximately Rs 9000 per month. Around 25% stated that the earning is between (Rs 400 to Rs 600 (Average 15000/month). It is in case of Tata Magic, the revenue earned per day ranges between Rs 400 to Rs 600. The reason for the difference in revenue is also due to the

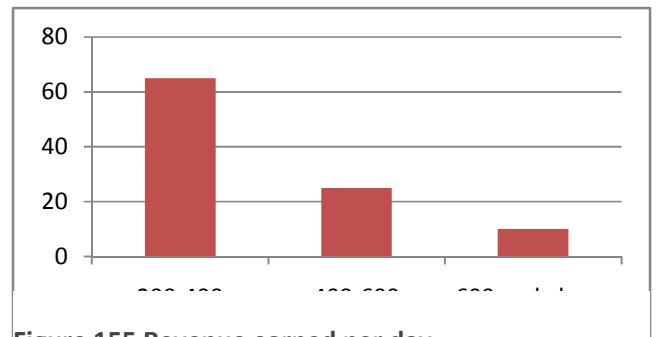


Figure 155 Revenue earned per day

variation of passenger's carriage on various routes. The Tata Magic carries more passenger s compared to 3 seater IPT. Also on some busy routes like railway stations, airports etc the earning again increases for drivers.

Other than fare box revenue no other permissions for revenue generation like advertisements, participation in rallies, etc. are given by the government. However, advertisements are being

put illegally with monthly charges of Rs 50 to Rs 100. The vehicles with school permit earn Rs 300 per month per student with maximum limit of 10 students in a vehicle.

Table 1 Revenue earned per month

Descriptions		Average Earning per day(Rs)	Average earning per month(Rs)	Rent/day (Rs)	Total earning per month(Rs)
Income in case of rented IPT	Private service	300	9,000	120	5400
Income in case of owned IPT	Private service	300	9,000	-	9,000
Income in case of rented IPT on profitable routes(near railway station and airport)	Private service	450	13,500	120	9,900
Income in case of owned IPT on profitable routes(near railway station and airport)	Private service	450	13,500	-	13,500
Income in case of rented Tata Magic	Shuttle services	500	15,000	250	7,500
Income in case of owned Tata Magic	Shuttle services	500	15,000	-	15,000
Income in case of rented Tata Magic on profitable routes(near Railway Station and Airport)	Shuttle services	600	18,000	250	10,500

<b>Income in case of owned Tata Magic on profitable routes(near Railway Station and Airport)</b>	<b>Shuttle services</b>	600	18,000	-	18,000
<b>Income in case of rented Tata Magic + school permit</b>	<b>Shuttle service</b>	500 + 100*	15000 + 3000	250	10,500
<b>Income in case of owned Tata Magic + school permit</b>	<b>Shuttle service</b>	500 + 100*	15000 + 3000	-	18,000
<b>Income in case of rented Tata Magic + Advertisement revenue</b>	<b>Shuttle service</b>	500 + 100**	15000+100	250	7,600
<b>Income in case of owned Tata Magic + Advertisement revenue</b>	<b>Shuttle service</b>	500+100**	15000+100	-	15,100
<b>Income in case of owned Auto rickshaw + Advertisement revenue</b>	<b>Private service</b>	300+100**	9,000 +100	-	9,100
<b>Income in case of rented Auto rickshaw + Advertisement revenue</b>	<b>Private service</b>	300 +100**	9,000 +100	120	5500

\*Maximum of 10 students is allowed with a monthly fee of Rs 300/ student.

\*\*Advertisement revenue at the rate of Rs 50 to Rs 100/month.

### c. Average length of the trip

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About 70 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms , about 25% stated that their trips are between 100 to 150 km and only 5 % stated that the average length travelled to be between 150-200 km. These long distance travel trips cater to the routes which are extending beyond the city limits on the outskirts usually for the daily wage earners who come to the urban areas for employment opportunities.

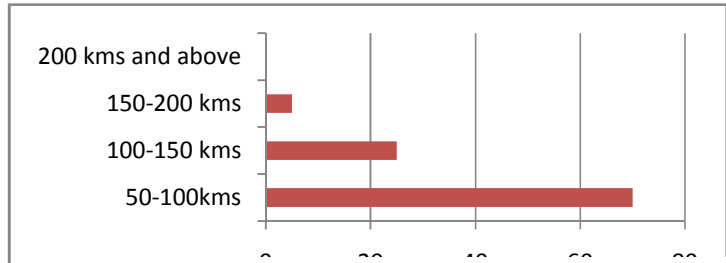


Figure 156 Avg. length of the trip travelled by auto

**d. Passengers travelled per day per auto**

It is stated that about 48% of the drivers carry up to 40 passengers per day, as these are usually private 3 seater IPT. On the other hand, around 42 % of the drivers carry approximately 80 passengers per day as these are Tata Magic providing shared services on the pre decided routes and therefore have more number of passengers and only 10% of the drivers carry more than 80 passengers per day because they are catering to some busy routes such as those of Railway station and Airport as well as carry more passengers during peak hours.

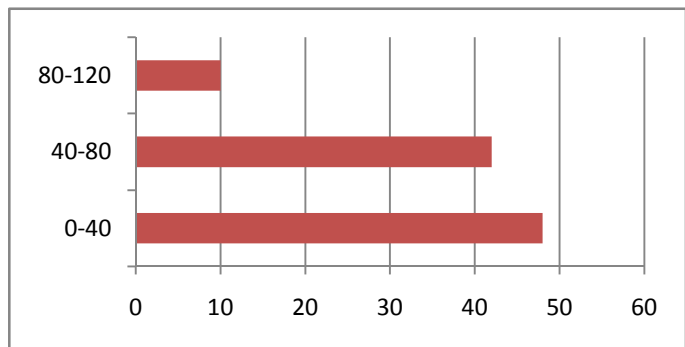
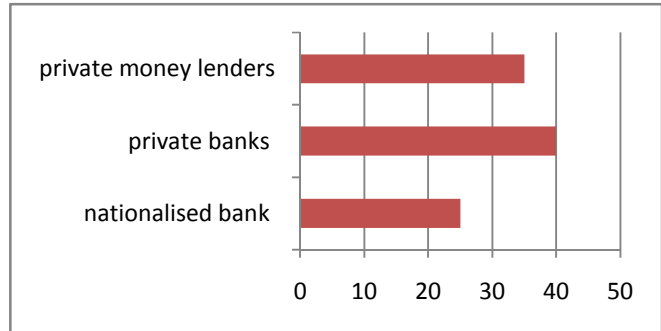


Figure 157 Passengers travelled per day per auto

**e. Funding provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents (refer to previous chapter) required by



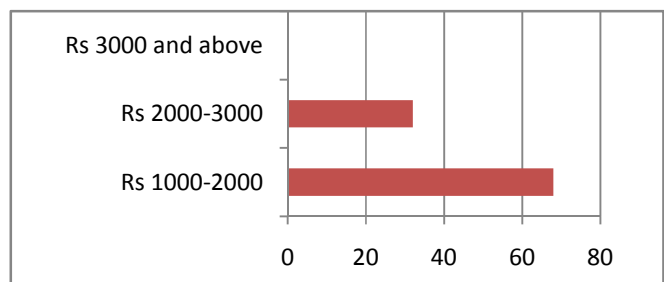
the banks to finance the loan. Hence the driver feels it easy to resort to a private

**Figure 158 Financing IPT**

financer even though the financer charges higher interest of 20 -25% as compared to nationalised banks which charge from 10.5- 12.5%. Some of the common financiers are State Bank of India, Tata finance, Jain Finance and L&T Finance etc. The only reason which tempts driver to go to a private financer is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 35 % of the auto rickshaw drivers prefer financing through a private money lenders rather than approaching banks even though it being a legal procedure. About 40 % get loans from private banks and about 25% from nationalised banks.

**f. Maintenance of vehicles**

About 68 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs1000-2000. The average maintenance cost per month is Rs 1500. 32% stated that the cost of



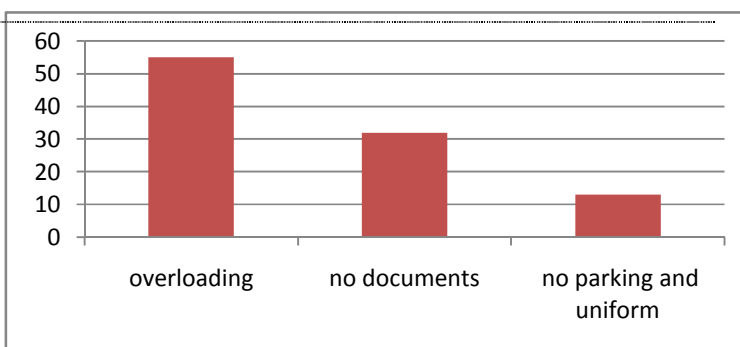
maintenance of the vehicles per month is from Rs 1500-Rs 2500 (average Rs 2000/month). The

**Figure 159 Average maintenance cost/ month**

reason for increase in maintenance cost is due to the 4 stroke engines and other expensive technology being used in the Tata magic compared to normal three wheeler auto using LPG or diesel.

**g. Other charges/penalties**

Fine and penalties are charged on auto drivers by the traffic police and RTO's mainly for overloading of passengers, without permit or documents, unauthorized parking, no uniform, etc. About 55% of the autos are fined for overloading, 32 % is fined for no documents and 13% for



**Figure 160 Reasons for penalties**

other reasons such as uniform. However the traffic penalties are often converted into sources of bribe for the city traffic officials. The overloaded vehicles are fined Rs 100 per extra person, Rs 100 for drivers not in uniform and Rs 100 for unauthorized parking for keeping their operations continued.

**Table 2 Total income and expenditure of auto drivers**

Descriptions		Total earning per month (in Rs)	Maintenance cost/month (In Rs)*	Payment to police /month (Rs)	Total expenditure /month (in Rs)	Total revenue/month (in Rs)
Income in case of rented IPT	Private service	5400	1500	-	1500	3900
Income in case of owned IPT	Private service	9000	1500	-	1500	7500
Income in case of rented	Private	11400	1500	-	1500	9900

<b>IPT on profitable routes(near railway station and airport)</b>	<b>service</b>					
<b>Income in case of owned IPT on profitable routes(near railway station and airport)</b>	<b>Private service</b>	15000	1500	-	1500	13500
<b>Income in case of rented Tata Magic</b>	<b>Shuttle services</b>	7500	2000	300**	2300	5200
<b>Income in case of owned Tata Magic</b>	<b>Shuttle services</b>	15000	2000	300**	2300	12700
<b>Income in case of rented Tata Magic on profitable routes(near Railway Station and Airport)</b>	<b>Shuttle services</b>	10500	2000	300**	2300	8300
<b>Income in case of owned Tata Magic on profitable routes(near Railway Station and Airport)</b>	<b>Shuttle services</b>	18000	2000	300**	2300	15800
<b>Income in case of rented Tata Magic + school permit</b>	<b>Shuttle service</b>	10500	2000	300**	2300	8,200
<b>Income in case of owned Tata Magic + school permit</b>	<b>Shuttle service</b>	18,000	2000	300**	2300	15,700
<b>Income in case of rented Tata Magic +</b>	<b>Shuttle service</b>	7600	2000	300**	2300	5,300



<b>Advertisement revenue</b>						
<b>Income in case of owned Tata Magic + Advertisement revenue</b>	<b>Shuttle service</b>	15,100	2000	300**	2300	12,800
<b>Income in case of owned Auto rickshaw + Advertisement revenue</b>	<b>Private service</b>	9,100	1500	-	1500	7,600
<b>Income in case of rented Auto rickshaw + Advertisement revenue</b>	<b>Private service</b>	5,500	1500	-	1500	4,000

\*average of maintenance cost per month taken

\*\* A yearly payment of Rs 4000 is given to the traffic police on Tata Magic routes as stated by the drivers. So, a monthly payment of approximately Rs 300 is taken as the payment to police.

#### **h. Association with unions**

There are 2 auto unions registered under the Trade Union Act, working for the private auto rickshaw as well as for the shared Tata Magic services. . The unions provide benefits in official matters like renewal of permits, getting loans sanctioned for new vehicles and act as mediators in case of disputes. The unions also provide legal support to its members. However in real terms the drivers are happy associating with the trade unions as these provide benefits to drivers. Recently, Jodhpur Auto Rickshaw Union in association with Vasan Eye care center organized a free eye testing camp for the auto rickshaw drivers and their families.

#### **i. Other problems**

1. As per the driver's survey 76 % of the drivers have obtained only primary education up to 5<sup>th</sup> standard, remaining 20% up to 8<sup>th</sup> standard and only 2% are graduate and above and 2% are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits given like training, medical facilities, etc.
3. Though the fleet size is fixed but still the competition is high as the number keeps increasing with political support.

4. Higher maintenance cost of Tata Magic of about Rs 2000/ month has a significant effect on the revenues earned by drivers.

**j. Other suggestions like financing assistance, provision of infrastructures, social benefit schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

**Infrastructure**

The drivers were asked to give their opinions on what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. About 55% respondents in Jodhpur suggested for provision of parking areas for the vehicles. However, the stands have been provided by the government with specified number of autos at each stand but there is a lack of enforcement due to which it often result in traffic chaos and quarrels among drivers.

**Financing**

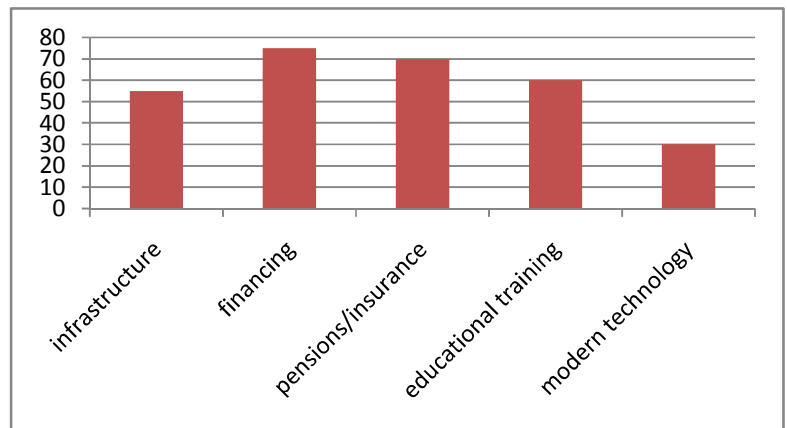
As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out money for providing charges to unions, rent to owners etc which decreases their revenue earnings. Hence, a common criteria that both the auto rickshaw drivers and unions (75%) suggested that the financing procedure of IPT should be made easier and loans should be provided at a lower rate from the banks. The practice of financing through private money lenders should be discouraged as they charge high rates of interest of about 20-25% which is unethical and leads to exploitation of the auto drivers.

## Pensions/Insurance

About 70% of auto rickshaw driver feels that insurance should be given for their future security, as the drivers are providing services to general public.

## Training Programmes:

About 60% of respondents in Jodhpur agreed to undergo training and educational training programmes for providing better service to customers.



## Usage of modern technology

When drivers were made aware of the modern technology such as tracking vehicles through GPS and services like dial a rickshaw, then only 30 % of the drivers suggested for such improvements to be added. The reason for less percentage is due to the fact that the drivers do not want to take an extra burden on them for installation of modern technology.

Figure 161 Suggestions for improvement

## k. Summary of findings from the drivers survey

1. From the survey it was found that the rented 3 seater IPT and Tata Magic are the worst sufferers as these drivers cannot provide better future to their families because the earning is below the mentioned minimum wage level for the state i.e.Rs 6270.
2. Lack of enforcement by Traffic police as the auto rickshaw stands are always encroached and therefore the autos stand on the road and causes congestion.
3. It is also seen from the survey that maintenance cost is higher for 3 seater 4 stroke auto rickshaw (average Rs 1500/month) as well as for the Tata Magic (average Rs

2000/month) and therefore the drivers use local parts for replacements often leading to breakdowns in services.

4. Lack of proper infrastructure facilities like parking areas, workshops for repairs etc.
5. From the survey, it has also been found that the drivers have to pay bribes and penalties to the traffic police which affect their revenue.
6. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also the driver often does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the finance charges higher interest at 20-25%. But this practice is causing exploitation of the auto rickshaw drivers and should be discouraged.
7. Since educational levels are poor, they are not much aware of the various insurance and other health schemes such as Navjeevan yojna, etc.

## User Survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 75 users on the basis of random sampling was carried out, at various locations of city, rural and other routes by selecting various characteristics that they associate with this IPT mode.

### a. Age group of users

From the survey it has been observed that all age groups of people use the IPT services. About 60 % of the surveyed users belong to the age group 30 to 50 years. 35 % belongs to the age group up to 30 years. Above the age group of 50, only 8% uses

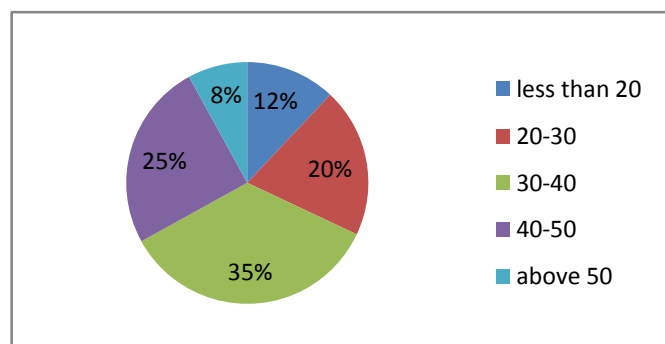


Figure 162 age profile of users

the service. Therefore, we can conclude that the IPT services are mostly used by the working population and to some extent by the college going students.

**b. Occupation of users**

From the survey it is observed that more than 40 % of the users belong to the private firms. About 16 % of the users are government employees, students account for 14% and 16% housewives. However around 14 % of people are having their own business in the city.

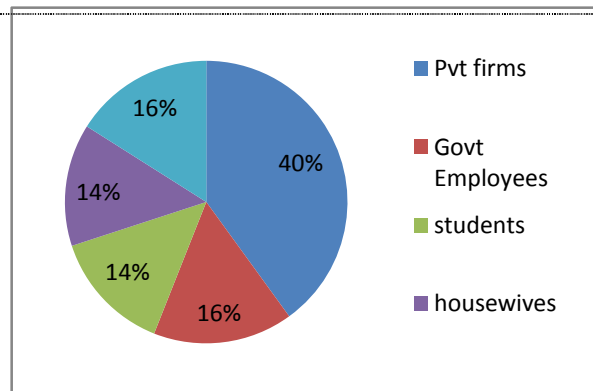
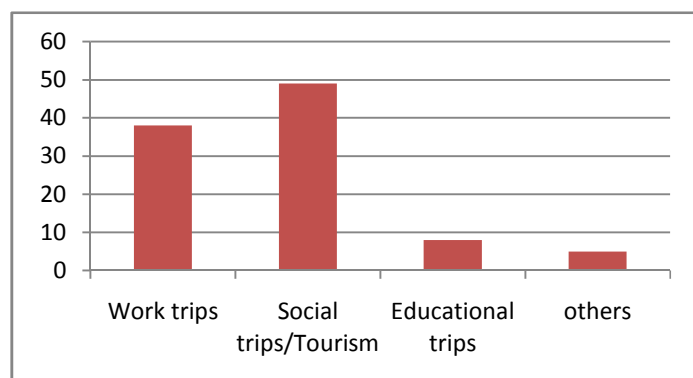


Figure 163 Occupation of users

**c. Purpose of trip by IPT**

It has been observed that 38 % of the trips are for work purpose and 49% for social purpose which also includes tourism as Jodhpur is a big tourist destination of Rajasthan. About 8%



uses for educational trips and 5% for some other purpose.

Figure 164 Trip purpose

**d. Average distance travelled by passengers**

It has been observed from the survey that about 53% of the users travel a distance of 2 to 10 km by the IPT services. These are usually local people travelling for day to day activities. It

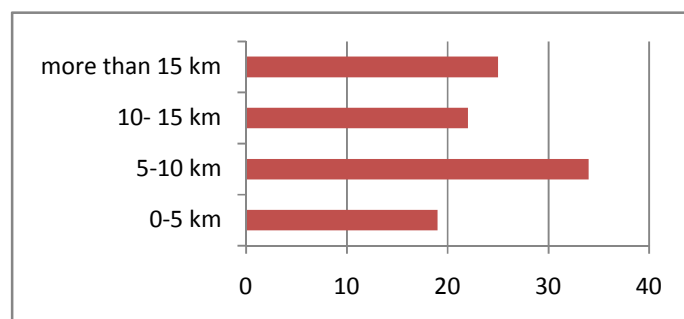
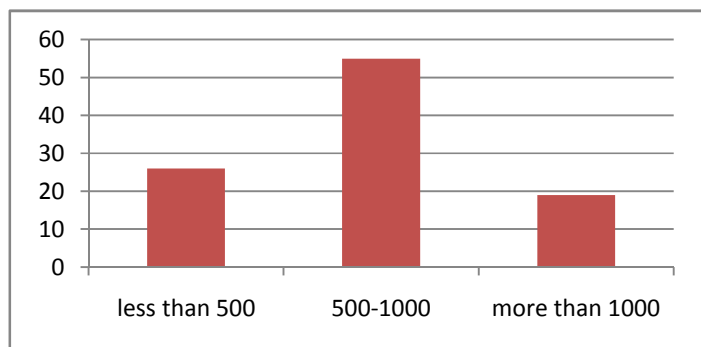


Figure 165 Average distance travelled by users

can also be observed from the graph that a good percentage of people about 47% travel a distance of more than 10 km. This is mainly because of the good number of tourists visiting Jodhpur throughout the year due to which the trip length increases and they travel for greater distances above 50 kms at times also.

**e. Expenditure per month**

It has been observed from the survey that most of the users, around 55% spend between Rs500-Rs1000/month on the IPT services. These are usually working professionals who daily use the service for their work trips. About 26% spend up to Rs500 as these are short trips by the students or the housewives.

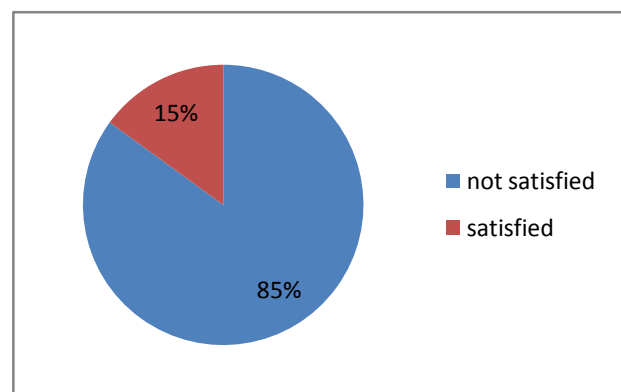


**Figure 167 Expenditure per month**

Only 19% of the users spend more than Rs1000 on the IPT services for long distance travel due to tourism.

**f. Safety and Security**

It has been observed that 85% of the users are not satisfied with the safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher especially for females and elderly. Overloading of vehicles by the drivers is also a major safety and security concern which often leads to accidents.



**Figure 166 safety and security mechanism in IPT vehicles**

**g. Reason for usage of IPT other than Public Transport**

This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

- 1. **Accessibility:** Accessibility of IPT was found to have been the most likely reason for preference over public transport. Around 76% of the respondents stated this reason as the 3 seater auto rickshaw can be found easily at every corner of the street. The same reason can be applied to Tata Magic as they also ply on major routes but there are some issues related to door to door services.
- 2. **Convenience:** Another characteristic associated with their preference was convenience. Around 72% respondents find IPT to be more convenient again for the main reason being its easy availability. Also the waiting time for these IPT are generally lower compared to the public transport therefore the overall journey becomes very convenient. For shared rickshaws, the convenient was lower as more people are carried at one time.

- 3. **Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus and easy

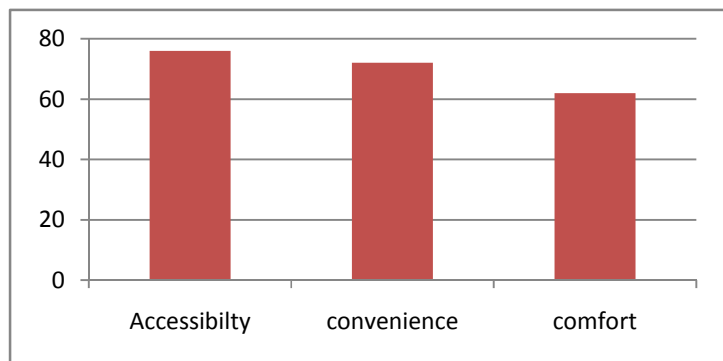


Figure 168 Reasons for usage of IPT

availability and connectivity are main characteristics for

comfort associated with the auto rickshaw. 62 % of the respondents using the service in Jodhpur said that it is comfortable. However 38 % complains of dis comfort as more

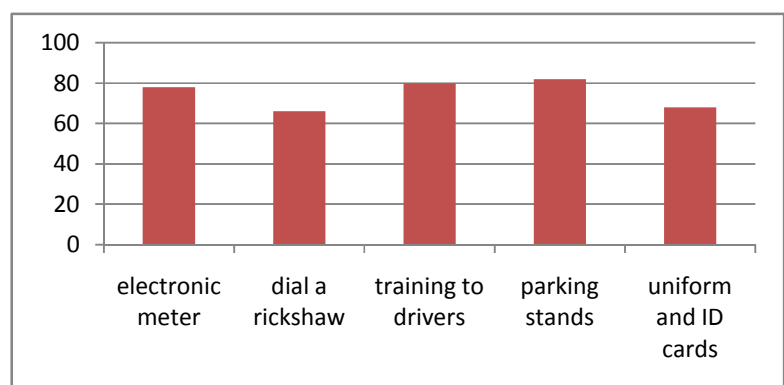
passengers are illegally carried in case of shared services by Tata Magic and due to long waiting time at stops in order to get passengers, the users have to wait.

#### **h. Other suggestions for organizing the services of IPT**

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1. Usage of modern technology- Though fares are fixed but are often bargained by the users and operators. Therefore, about 84 % of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.

2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 66 % passengers are willing to use the services. The other 34% believes that there will be extra transaction charges



**Figure 169 Other suggestions**

associated with the modern technology used, as a result people would not prefer to use the services.

3. Training to drivers on road safety and driving skills were also agreed by about 80 % of the users. As the drivers often drive rashly according to passenger's perception.

4. 82% of the users suggested to build the dedicated parking areas for IPT as their illegal parking on the streets create traffic congestion and chaos.

5. About 68% of users agreed that uniform dress code and identity card to all drivers to make it safe for users using the services for easy identification of the drivers.

#### **i. Summary of the findings from the user survey**

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1. Though meters are installed in all 3 seater IPT, but they are not mainly used by drivers leading to disputes between users and drivers.



2. Carriage of more passengers in case of shared IPT as compared to the design capacity of the rickshaws, leading to dis comfort.
3. Safety and security mechanisms are missing therefore the users especially females and elderly do not feel safe to use the services after evening.
4. In case of shared service, long waiting time at certain locations in search of passengers leads to dis comfort of commuters.
5. Non availability of IPT services at night is also a major issue for commuters going to railway stations or in case of emergency.

# City Analysis – Ghaziabad

## City Profile - Background

Ghaziabad city is located in the state of Uttar Pradesh. It is part of the National Capital Region of Delhi. It is a large and planned industrial city with a population of 2,358,525. (Census, 2011).

## Transport scenario

There are a wide variety of transport modes used in Ghaziabad city to meet travel needs -Cars, 2 wheelers, bicycles, IPT (3 wheelers with 3 or 6 seaters). Also developed recently is the bus service operated by the Ghaziabad Development Authority and the metro since 2010 (Vaishali).

The total number of registered IPT in the city is approximately 16,458 (tempo 1,735 and 14,723 three-seater IPT RTO Ghaziabad, 2014). Most of the trips are made by 2-wheelers, shared autos, cycles and public transport. Also the Ghaziabad population have access to the Delhi metro, from Vaishali station (Blue Line).

## IPT System

The type of IPT functioning in Ghaziabad City is

### Auto rickshaw (3 seater capacity) –

This type of auto rickshaw is the commonly found auto rickshaw which operates on a private basis in the city. They are generally used as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another. They are also used as an access or egress mode to the formal PT system. 3-seater IPT carry more than 3 passengers at times, as an illegal practice. These also charge arbitrary fares, as the fares are not regulated by RTO. The fares starts at Rs 30, in case of private hired basis.

### Tempo (7seaters)

This type of auto is the commonly found tempo which operates on a shared basis from one destination to another in the city on a pre-decided route fixed by RTO and fare decided by the unions. They are generally used as an alternative to PT system in absence of personal

vehicle as a main mode connecting from one destination to another and as an access or egress mode to the formal PT system. 7seaters capacity IPT ply as “shuttle services” carrying more than 6 passengers to even 10 passengers at times, as an illegal practice. These charge Rs. 7 – 25 from one stop to another.

### **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city. Though aware, of the three wheeler system prevailing in the city, the authorities are not stringent about the violations and the number of illegal IPT that are running in the city.

### **Routes and fares**

The routes of Tempos are fixed by the RTO. There are in total 28 routes and the distance fixed by RTO for each routes are about 10 kms only. The highest fleet strength depends on areas where the route is the busiest like railway station, main CBD areas etc. and number decreases with decrease in demand of areas. Though the fleet strength for is fixed by RTO but often it is complained by drivers that the fleet size in a particular route has increased due to political backing. In case of the 3 seater IPT they are allowed to ply anywhere within the city. However at times the 3 seater also acts as shared services in few areas of the city.

The fares are not fixed from the RTO in case of 3 seater IPT as well as for 7 seater IPT. The drivers charge arbitrarily. For the tempos the minimum rate is Rs 7 to Rs 25.

### **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.1500 along with the following documents:

- Filled application form to the Regional Transport Officer.
- Residence Proof
- Age proof certificate
- Financial capability

- Bank account statement
- Driving license
- Insurance certificate

The time taken for processing is of two weeks from the date of application. The permit is renewed after every 5 years at a payment of Rs 1500. Penalties are charged according to the days of delay in the renewal process (Rs 1000 after 90 days).

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Motor vehicles act 1988 and Central Motor Vehicles Rules.

### **Infrastructure for IPT**

At present, there is virtually no planning for IPT in the city. No IPT stands or dedicated tracks have been provided in the city. The stands that are provided and demarcated in the city by the RTO are not enough and due to lack of proper enforcement results in queuing at critical junctions on roads and thus contributing to congestion levels. Also no workshops or repairing shops are provided for repair of IPT Vehicles.

### **Vehicle characteristics**

About 85% of the vehicles have a 2 stroke CNG engine. Only 15% of the vehicles are 4-stroke CNG.

### **Sample size for Auto rickshaw drivers and users survey**

Surveys were carried out for drivers and users of IPT in Ghaziabad city. 100 surveys for drivers and user were conducted through random sampling method at few of the locations based on the busiest, medium and low used routes of city. Survey locations are Vaishali Metro Station, Loni Bus terminal, ShahpurNijMorta, and Nehru nagar.



Figure 170 Survey Locations

## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

### a. Ownership of Vehicles

About 70% of the drivers surveyed at various locations of the city stated that they have rented the auto rickshaw they drive. Ownership in Ghaziabad is 30%. The main reason being that, they have not enough money to purchase an auto rickshaw as most of the people who drive the rickshaws

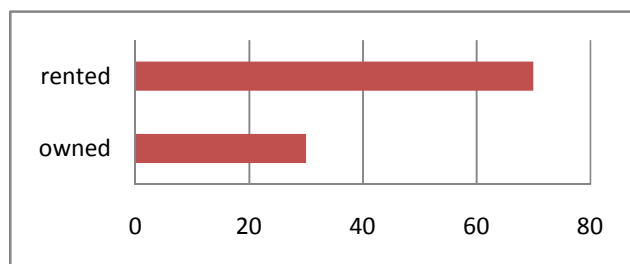


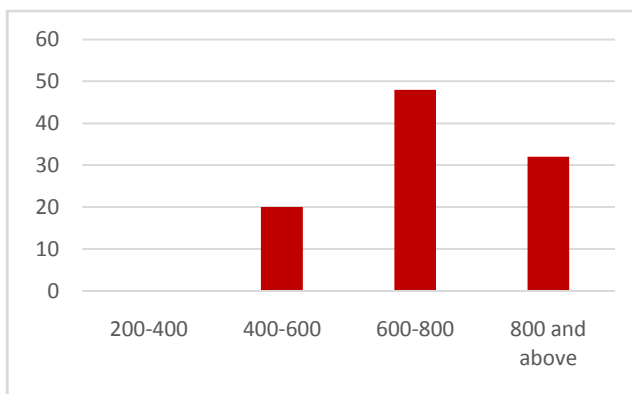
Figure 171 Ownership of vehicles

are migrants from nearby states like Bihar, and work as seasonal labor and second reason

purchasing an auto rickshaw through a loan from banks is a lengthy and a tedious process due to too much documentation required (Documents required are given in section g). It is also observed that out of the owners majority owns about 2-4 IPT. Also the rent paid by the drivers to their owners is Rs 350-400 daily.

**b. Revenue earned per day**

About 20% of 3 seaters that are run as private services earn between Rs 400-600 .The average earning is Rs 15,000 per month. 48% of the driver stated that the earning per day is between Rs 600-800. The average earning per month is Rs 21,000.Only 30% stated that the earning is



**Figure 172 Revenue Earned per day**

between Rs 800 and above. The average earning per month is Rs 30,000. The higher earnings are due to the shared tempo services as the number of passengers carried is higher and illegally carriage of more passengers and arbitrary fares fixed by drivers themselves by 3 seater IPT leads to greater earning.

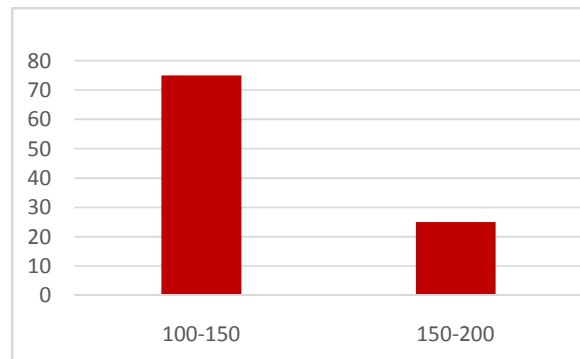
Also the vehicles that are rented have to pay an amount of Rs 350-400 per day (in the case of rickshaws), and Rs 500 (in the case of tempos) to their owners from the daily earnings. Other than fare box revenue no other permissions for revenue generation like advertisements, participation in rallies, schools etc are given by the government. Comparative table showing earning of rented and owned IPT are given below:

**Table 1 Revenue earned per month**

Descriptions		Earning per day	Average earning per month	Average Rent/day	Total earning per month
Income in case of rented IPT	Private services	Rs 400-600	Rs 15,000	Rs 350	Rs 4,500
Income in case of rented IPT	shuttle services	Rs600- 800	Rs 21,000	Rs 350	Rs 10,500
Income in case of owned IPT	Private services	Rs 400-600	Rs 15,000	-	Rs 15,000
Income in case of owned IPT	shuttle services	Rs600- 800	Rs 21,000	-	Rs 21,000
Income in case of rented Tempo	shuttle services	Rs 800-1200	Rs 30,000	Rs 500	Rs 15,000
Income in case of owned tempo	shuttle services	Rs 800-1200	Rs 30,000	-	Rs 30,000

**c. Average length travelled by auto per day**

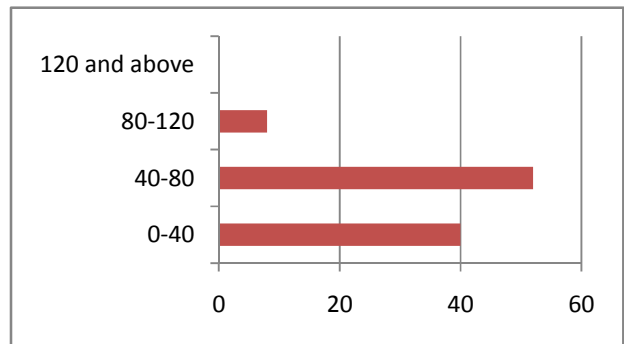
About 75 % of the drivers stated that the average length travelled by auto per day is between 100-150kms and only 25 % stated that the average length travelled is between 150-200kms.



**Figure 173 Average length travelled /auto/day**

**d. Passengers travelled per day per auto**

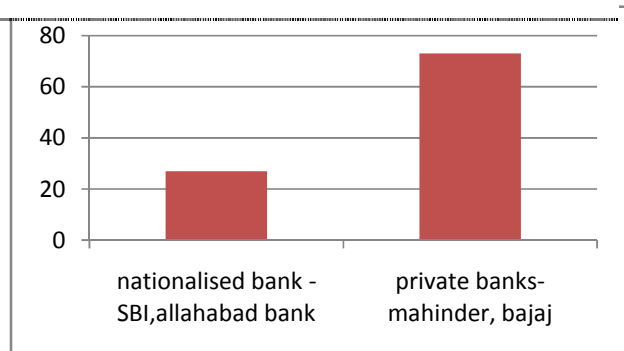
It is stated that about 40% of drivers carries between 0-40 passengers per auto per day for the private autos. For the shared autos, 52% of the drivers carry between 40 and 80 passengers as the IPT run on shared basis. Only 8% carries more than 80-120 passengers per day per auto, this is due to overloading of passengers in the outskirts of the cities.



**Figure 174** Passengers travelled per day per auto

**e. Funding Provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents\* required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier\*\* even though the financier charges higher interest of 20-25% as compared to nationalised banks which charge from 10.5- 12.5%. Some of the common financiers are HDFC Bank, Uco Bank, Allahabad Bank, IDBI bank limited. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 73% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks even though it being a legal procedure.

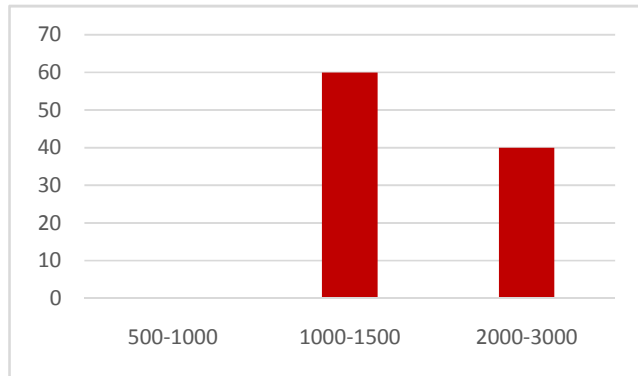


**Figure 175** Financing IPT



**f. Maintenance cost of vehicles.**

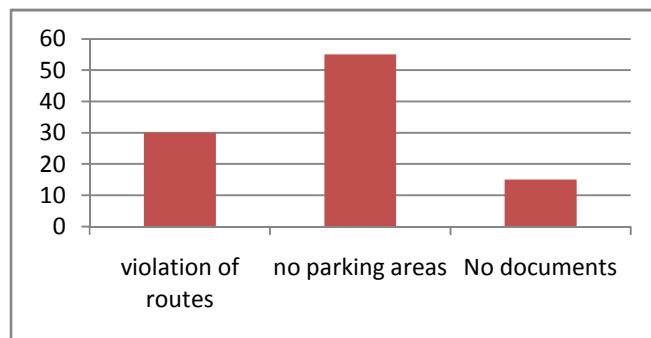
About 40 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 2000 to Rs 3000 for 4 stroke vehicles. The average maintenance cost per month is Rs 2500. 60% stated that the cost of maintenance of the vehicles per month is from Rs1500-Rs 2000 (average Rs 1750/month) as these drivers are mainly 2-stroke tempos. Thus, the average maintenance cost is Rs 2200 rupees approx. per month.



**Figure 176** Maintenance cost per month

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for traffic rule violations. The major cause for fines as found from the driver survey is route violations, standing in no parking areas and sometimes absence of adequate documents as required. However, the traffic penalties are often converted into a source of bribe by the city traffic officials. Due to standing in no parking areas therefore charge of Rs 250 is charged from drivers. Route violations are charged Rs 2000. The drivers are also charged Rs 10 per week by unauthorized people calling themselves from the Nagar Nigam at the various IPT stands.



**Figure 177** Reasons for bribes/penalties

The total income and expenditure are given below:

**Table 2 Total income and expenditure of auto drivers**

Descriptions		Total earning per month (In Rs)	Maintenance cost/month*(In Rs)	Payment to unauthorized people /week (Rs)	Total expenditure /month (in Rs)	Total revenue/month (in Rs)
Income in case of rented IPT	Private services	4,500	2,200	40	2,240	2,260
Income in case of rented IPT	shuttle services	10,500	2,200	40	2,240	8,260
Income in case of owned IPT	Private services	15,000	2,200	40	2,240	12,760
Income in case of owned IPT	shuttle services	21,000	2,200	40	2,240	18,760
Income in case of rented Tempo	shuttle services	15,000	1750	40	1,790	13,250
Income in case of owned tempo	shuttle services	30,000	1750	40	1,790	28,210

\*average of maintenance cost per month taken

**h. Association with unions**

There are no registered trade unions in the city.

**i. Other problems**

1. As per the driver's survey 90 % of the drivers have obtained only primary education or are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, and education facilities.

3. Competition increases between drivers though the routes and fleet size is fixed by RTO, as number of IPT keep increasing due to political support.

j. **Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

### Infrastructure

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 80% respondents in Ghaziabad suggested for provision of auto rickshaw stands at appropriate locations for their improvement which enables access to get passengers easily, which in turn would also reduce the hassles they have to deal with traffic police on daily basis for encroaching the roads while waiting for potential passengers at critical locations.

### Financing

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out money for providing charges to unions, rent to owners etc which decreases their revenue earnings. Hence a common criteria that both the auto rickshaw

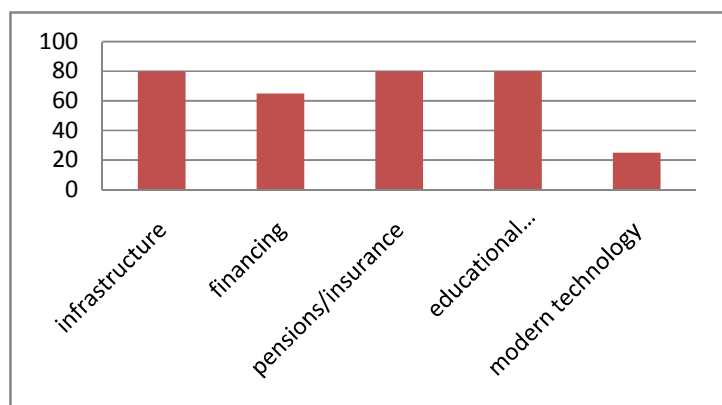


Figure 178 Suggestions for improvement

drivers and unions (65%) suggested that the legal financing procedure of IPT should be made easier. And also they suggested that it would be better if government comes up with beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

### **Pensions/Insurance**

About 80% of auto rickshaw driver feels that insurance should be given insurance for their future security, as the drivers are providing services to general public.

### **Training Programs**

About 80% of respondents agreed to undergo training and educational training programs for providing better service to customers.

### **Usage of modern technology**

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then only 25 % of the drivers suggested for such improvement to be added. This response is one of the lowest as the drivers feel that the cost of the maintenance of autos will be higher with introduction of new technology and secondly if law is passed by center for implementation of GPS in IPT then the drivers have to shelve out money from their own pockets. So the drivers do not prefer implementation of new technologies.

### **k. Summary of findings from drivers survey**

---

1. A general auto rickshaw driver of 3 seater rented IPT and some of the rented shuttle services within the city on an average earns Rs. 400- Rs. 800 per day which does not enable him to provide a better future to his family (Refer table1and 2). Also the earning from rented IPT is lower than owned rickshaws. It is also observed that most of the rented 3 seater auto rickshaw drivers do not even earn the minimum wages as fixed by the Labour Welfare Department of Uttar Pradesh (Rs 9000 per month). Therefore these are said to be the worse sufferers.
2. It is also observed that maintenance cost is higher in case of four stroke vehicles (avg Rs 2500 per month) compared to two stroke vehicles, therefore the drivers do not find

much incentive to buy such vehicles. They prefer to continue with the old vehicles without scrapping them.

3. Lack of proper infrastructure facilities like auto stands, parking areas, workshops for repairs etc.
4. Though all the IPT run on CNG but still not enough fuel refilling stations are provided in the city.
5. Competition increases between drivers though the number of permits and fleet size in case of tempos are fixed by RTO, as the number of autos continues to grow due to political support.
6. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 20-25%. But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.
7. Since the educational levels are lower therefore computerized driving test are not possible to be given.
8. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.
9. Removal of political parties influences from the IPT unions as these are just an additional source for providing funds to the parties rather than providing benefits to the drivers.

## Users survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 100 users on the basis of random sampling was carried out, at various locations. By selecting various characteristics that they associate with this IPT mode

### a. Age group of users

From the survey it has been observed that above 20 years all age groups of people use the IPT services. About 75% of the surveyed users belong to the age group 20 to 40 years. Only 20 % belongs to the age group between 40- 50 years. Above the age group of 50, only 5 % uses the service. Therefore the IPT services are mostly used by the working population.

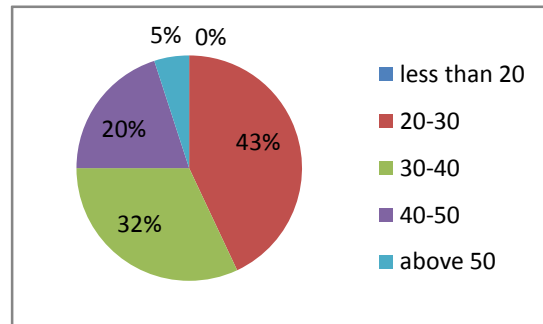


Figure 179 age profile of users

### b. Occupations of users

From the survey it is observed that more than 43 % of the users belong to the private firms. About 13 % of the government uses IPT services, students account for 18% and 12% to housewives.

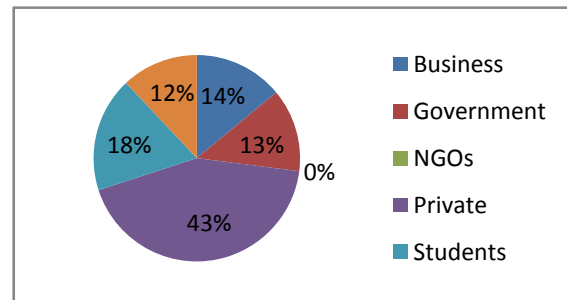


Figure 180 Occupation

### c. Purpose of trip by IPT

It has been observed that 40 % of the trip purposes for which these IPT services are used are for work purpose and 30% for social purpose. 30% uses for educational trips. The social and educational trips are more or less equal as there is no proper public transport system in the city.

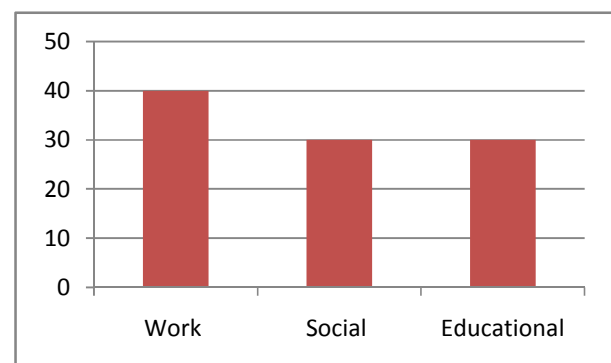
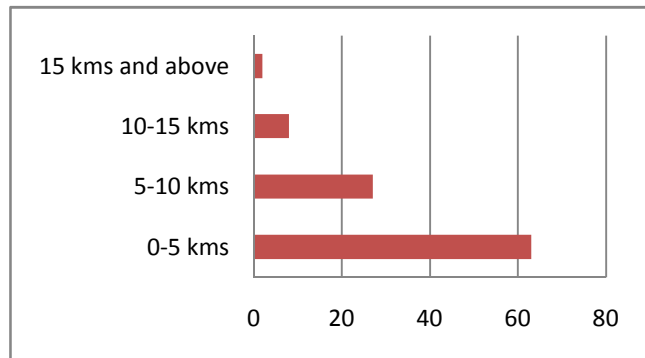


Figure 181 Trip purpose

**d. Average distance travelled by passengers**

It has been observed that 90% of users travel by IPT for a small to medium distance trips of not more than 10 kms as the routes of shared autos are fixed by RTO. However only about 10% of the users travel more than distance of 10 kms and above.



**Figure 182 Average distance travelled by users**

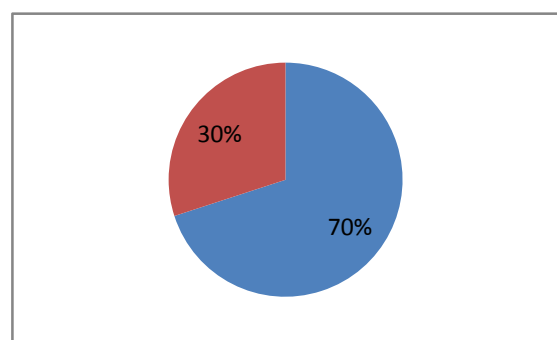
**e. Expenditure per month**

Most of the users travel by shared autos, which cost from Rs 7 to 25 according to the distance covered. Hence, the monthly expenditure varies from Rs 420 to 1500. The average monthly expenditure is around Rs 1000.

For those travelling in private autos, the expenses are more. It generally starts at 25 rupees for the first two kilometers, and approximately 8 rupees are added for each kilometer covered. But there is no fixed fare for private autos in Ghaziabad. For a journey of 5km, the fare would be 50 rupees. For 10Km, the fare would be 90 rupees. The average monthly expenditure would be between 3000 and 5000 rupees. That is the reason why people don't prefer private autos.

**f. Safety and Security**

It has been stated that 70% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher. But another 30% of people are of the opinion that autos are safe modes of travel as they run on shared basis.



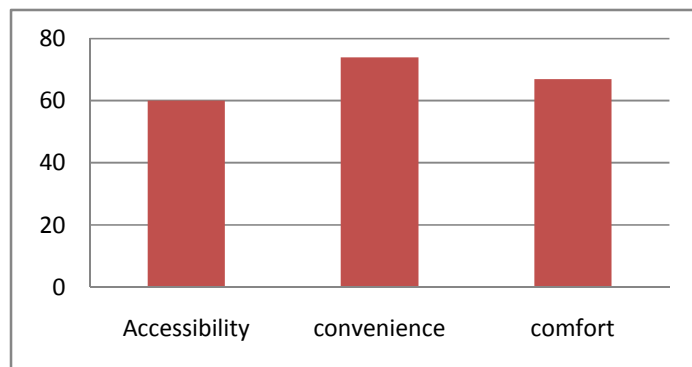
**Figure 183 safety and security mechanism in IPT vehicles**

**g. Reasons for usage of IPT other than Public transport**

This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

**1. Accessibility:** Nearly 60% respondents found IPT to be more accessible. The main reason being availability of auto rickshaw whenever required at all locations, though night services are not provided. However the other 40% of users claim that it is not accessible because of the fixed routes therefore these IPT do not provide door to door services.

**2. Convenience:** Another characteristic associated with their preference was convenience. Around 74% respondents find IPT to be more convenient again for the



**Figure 184 Reasons for usage of IPT**

main reason being its easy availability. Also the waiting

time for these IPT are generally lower compared to the public transport therefore the overall journey becomes very convenient. The rest 26% of surveyed users believe that it's not convenient service because the waiting time is higher for passengers in case of shared services.

**3. Comfortable:** Comfort was one of the important criteria that people associated with their preference for autorickshaws. Guaranteed seat, less commotion as compared to bus and easy availability and connectivity are main characteristics for comfort associated with the autorickshaw. 67 % of the respondents using auto in Ghaziabadsaid that it is comfortable. However, few users complain of dis comfort in case of shared IPT,



as more passengers are illegally carried and have long waiting time at stops in order to get passengers.

#### h. Other Suggestions for organizing services of IPT

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1. Usage of modern technology- About 90% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.

2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 64% passengers are willing to use the services. The other 36% believes that there will be extra transaction charges associated with

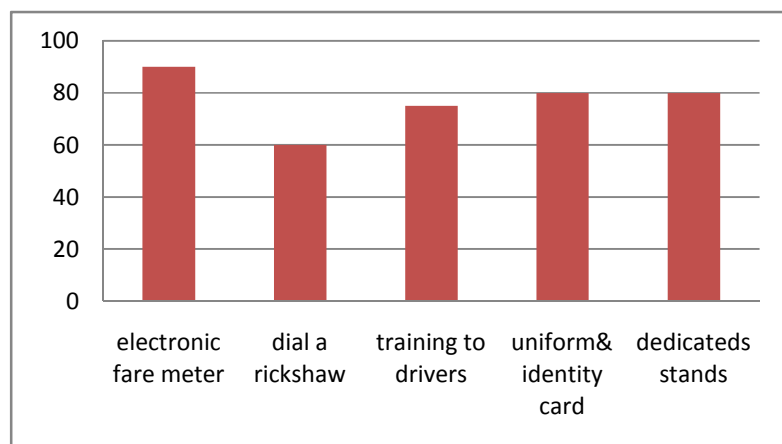


Figure 185 other suggestions

the modern technology used, as a result people would not prefer to use the services.

3. Training to drivers on road safety and driving skills were also agreed by about 75 % of the users. As the drivers often drive rashly according to passenger's perception.
4. 80 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion on busy roads.
5. About 80 % of users agreed that uniform dress code and identity card to all drivers make it safe for users using the service as lot of crime takes place in the city.

**i. Summary of findings from Users survey**

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1. Charging of higher fares as the fare meters do not work and driver's charge illegally leading to dispute between users and drivers.
2. Due to absence of dedicated auto rickshaw stands and parking areas often there is found chaos and congestion on roads.
3. Carriage of more passengers as compared to the design capacity of the rickshaws, leading to dis comfort (in case of shared auto-rickshaws).
4. In case of shared rickshaws, long waiting time at certain locations in search of passengers leads to dis comfort of commuters.
5. Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services after evening.
6. Non availability of IPT services at night time in order to provide convenience to passengers.

# City Analysis – Delhi

## City Profile - Background

Delhi, also known as the National Capital Territory of Delhi, is a metropolitan region located in the northern part of India. With a population of nearly 22.2 million residents as of 2011, it is the second most populous urban agglomeration in the world, as well as the largest city India by land area. Through most of its history, Delhi has served as a capital of various kingdoms and empires. It has been rebuilt several times and the modern Delhi is a cluster of a number of cities spread across the metropolitan region.

## Transport scenario

There are a wide variety of transport modes in Delhi -Cars, 2 wheelers, bicycles, IPT (3 wheeled), shared autos (6 seater), city bus service(2323 in operation) and metro railway. These are used to meet daily travel needs of the residents of Delhi.

The total number of registered IPT in the city is approximately 72,520 (RTO Delhi, 2014). The modal share for the city of Delhi shows that 21% trips are made by walking, 12% on bicycle, 5% by IPT, 43 % by Public transport(PT) and around 19% by private motorized transport (MoUD, 2008).

## IPT System

The types of IPT functioning in Delhi City is

### Auto rickshaw (3 seater capacity) –

This type of auto rickshaw is commonly found in the city and fares are decided from the RTO. They are generally used by users as an access or egress mode to the formal PT system or are also used as a competitor to public transport or as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another. The meter starts at Rs. 25 (first two kilometers), and then increases at the rate of Rs. 8 per kilometer (as per

revised auto rickshaw fare of 4-05-13). The 3 seater capacity IPT sometimes ply as “shared autos” in few areas of the city, charging Rs. 20 per passenger for less than 2 kilometers.

### **Tata Magic – Gramin Seva (Shared autos – 6seats)**

These are 8 seater Euro IV CNG run vehicles, plying on definite route given by the RTO Delhi. The fares also are fixed by the RTO, the minimum being Rs. 5 and increases with distance. These services were implemented by the government of Delhi to cover remote or isolated places, uncovered by the city bus service. Most of them are overcrowded and carry up to 10-12 passengers. In April 2014, 6153 vehicles had been registered.

### **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city.

### **Routes and fares**

The routes of Gramin Seva are fixed by the RTO. In total, there are 166 routes with a fleet strength varying from 10 to 500 approximately. The highest fleet strength depends on areas where the route is the busiest like areas that are more congested etc. and number decreases with decrease in demand of areas. The minimum fare for Gramin Seva is Rs 5 per person (for the first 3km), Rs 10 for upto 7km and Rs 15 above 7km.

For the 3 seater auto rickshaw the routes are not fixed, as the auto can ply anywhere in the city. The fare structure is decided by the RTO. The revision of fare is done based on increase in cost of CNG gases, but not on a regular basis. The minimum fare for 3-seater IPT is Rs 25 (for the first 2km) and Rs 8 per increase in kilometer. Though meter is provided but often drivers charge illegally.

### **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.1000 along with the following documents:

- Filled application form to the Regional Transport Officer (Form 20)

- Residence Proof
- Insurance certificate
- Financial capability
- Bank account statement
- Driving license

For auto-rickshaws, the permit can be got within 15 days. The permit is renewed after every 5 years at a payment of Rs 1000. Penalties are charged according to the days of delay in the renewal process (Rs 20 perday). For GraminSeva, the permit fees are Rs 2000, valid for five years.

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and Delhi Motor Vehicles Rules (1993).

### **Infrastructure for IPT**

At present there is hardly any planning for IPT in the city. No IPT stands or dedicated tracks have been provided in the city. The stands that are found in the city are demarcated by the auto drivers themselves based on the availability of road space on each route, resulting in queuing at critical junctions and thus contributing to congestion levels. Though the 3-seaters auto serves as a feeder, but there is no specific interchange point leading to inconvenience of passengers. Also no workshops or repairing shops are provided for repair of IPT Vehicles.

Delhi has recently implemented “Halt and go” stops, where the rickshaw enters a lane built on the side of the road, the passenger hops inside and the vehicle starts immediately. It leads to less congestion on roads. It is also a safer option for the users. It is usually implemented at metro stations, railway stations or main bus stops in only few areas. PWD and MCD are currently building new infrastructures.

### **Vehicle characteristics**

In order to meet the pollution standards in the year 2000 there was a sudden conversion notifications issued by the High court of Delhi after which all 2 stroke IPT were converted to 4 stroke CNG in order to control pollution levels. Government provided subsidies for the conversion. At present all the IPT found in the city are running on 4 stroke CNG.

### Sample size for Auto rickshaw drivers and users survey

Surveys were carried out for drivers and users of IPT in Delhi city. 100 surveys for drivers and user were conducted through random sampling method at few of the locations based on the busiest, medium and low used routes of city. Survey locations are New Delhi Railway Station, Interstate Bus Terminals (ISBT) Kashmere Gate, Jawaharlal Nehru University (VasantKunj), Race Course Metro station, Lajpat Nagar, Dwarka.

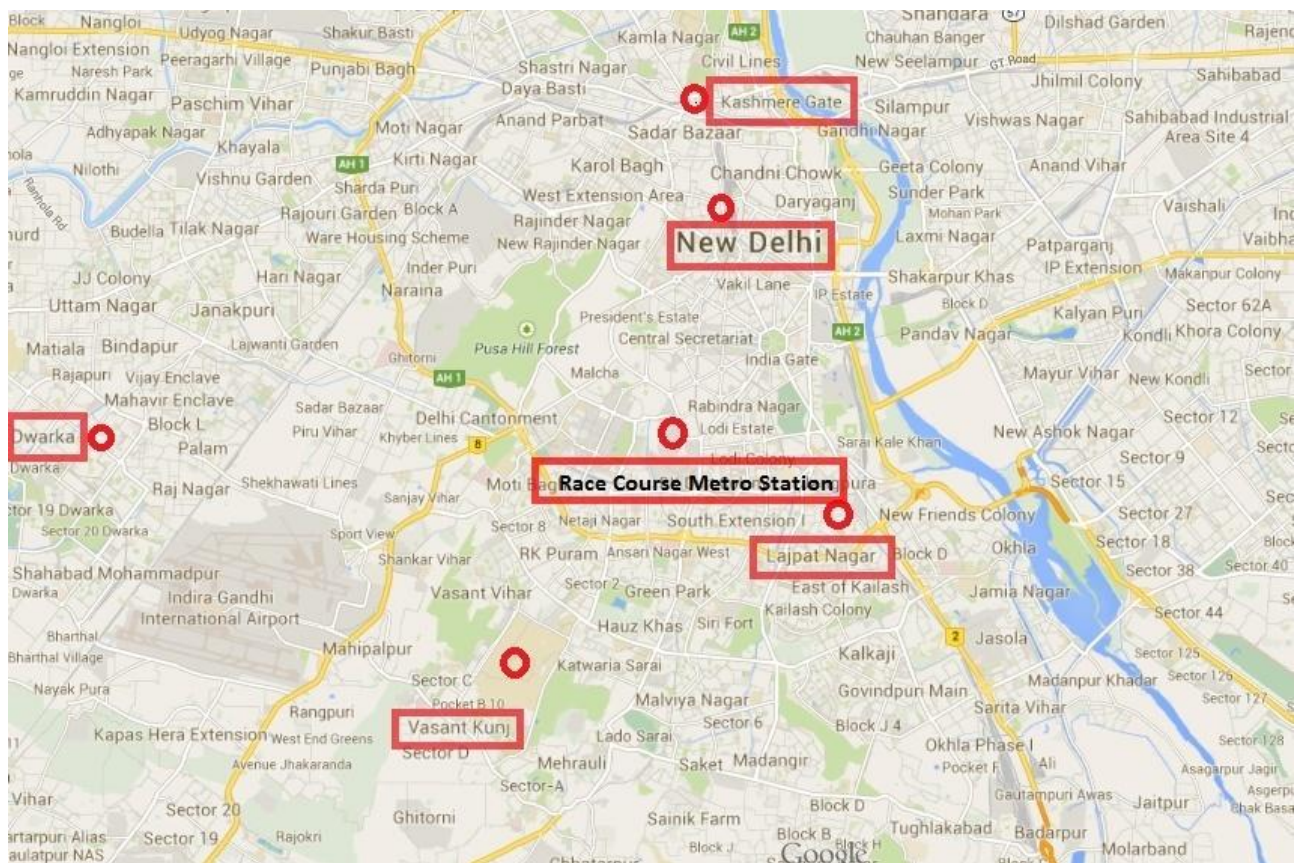


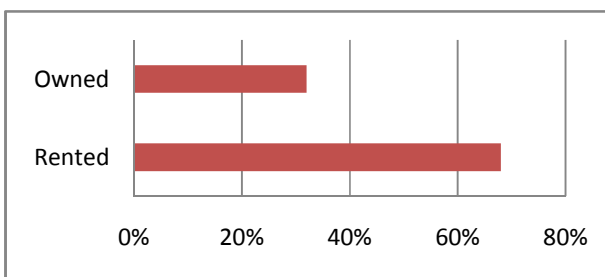
Figure 186 Survey Locations

### Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

**a. Ownership of Vehicles**

About 68% of the drivers surveyed at various locations of the city stated that they have rented the auto rickshaw they drive. Ownership in Delhi is 32%. The main reason being that, they have not enough money to purchase an auto rickshaw as most of the people

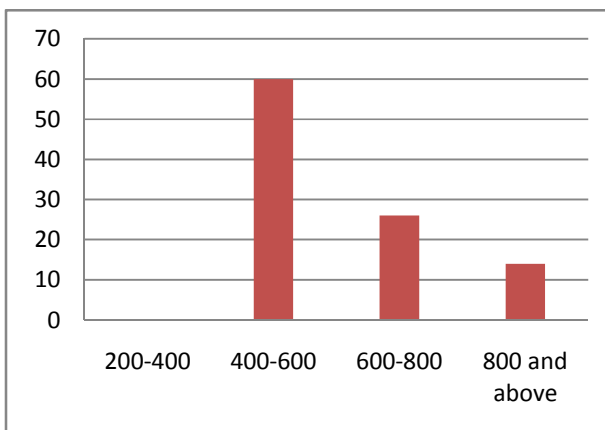


who drive the rickshaws are migrants from Bihar and UP and second reason purchasing an auto rickshaw through a loan from banks is a lengthy and a tedious process due to too much documentation required (Documents required are given in section g). It is also observed that out of the owners majority owns about 2-4 IPT. Also the rent paid by the drivers to their owners is around Rs 250-300 daily for 3 seater IPT. Gramin Seva has to pay a fixed rent of Rs 500 per day.

**Figure 187 Ownership of vehicles**

**b. Revenue earned per day**

60% the drivers stated that the revenue collected per day varies between Rs 400- Rs 600, corresponding to the 3 seater auto drivers. The average earning per month is Rs 15,000. Only 26 % earns between Rs 600-Rs 800 as they are working in high demand areas like railway stations and airports. The average income per month is Rs 21,000. However, for Gramin Seva drivers, the income increases



**Figure 188 Revenue Earned per day**

beyond Rs 21,000 as they carry more passengers. They earn between 800 and 1000 a day. The

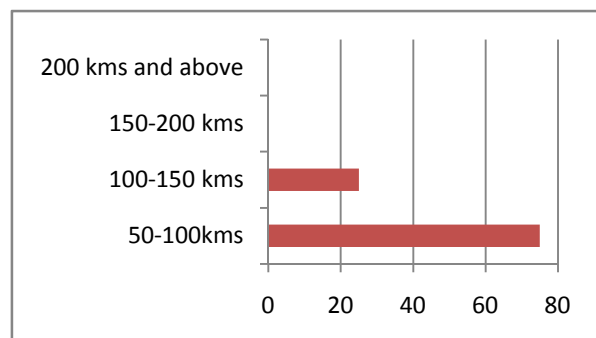
average income per month is Rs 27,000. Also in areas where there is absence of public transport, the drivers charge higher fares from individuals. Also the IPT that are rented have to pay an amount of Rs 250-300 per day to their owners from the daily earnings. Gramin Seva has to pay a fixed rent of Rs 500 per day.

Other than fare box revenue no other permissions for revenue generation like advertisements, participation in rallies, schools etc are given by the government. However in some cases the drivers themselves put advertisements though considered illegal. Comparative table showing earning of rented and owned IPT are given below:

Table 4 Revenue earned per month

Descriptions		Earning per day	Average earning per month	Rent/day	Total earning per month
<b>Income in case of rented IPT</b>	Private services	Rs 400- Rs 600	Rs 15,000	Rs 275	Rs 6,750
<b>Income in case of owned IPT</b>	Private services	Rs 400- Rs 600	Rs 15,000	-	Rs 15,000
<b>Income in case of rented IPT( profitable routes like bus stands , railway stations )</b>	Private services	Rs 600- 800	21,000	Rs 275	Rs 12,750
<b>Income in case of owned IPT( profitable routes like bus stands , railway stations )</b>	Private services	Rs 600- 800	21,000	-	Rs 21,000
<b>Income in case of rented Gramin Seva</b>	Shuttle services	Rs 800- Rs 1000	Rs 27,000	Rs 500	Rs 12,000
<b>Income in case of owned Gramin Seva</b>	Shuttle services	Rs 800- Rs 1000	RS 27,000	-	Rs 27,000

**c. Average length travelled by auto per day**

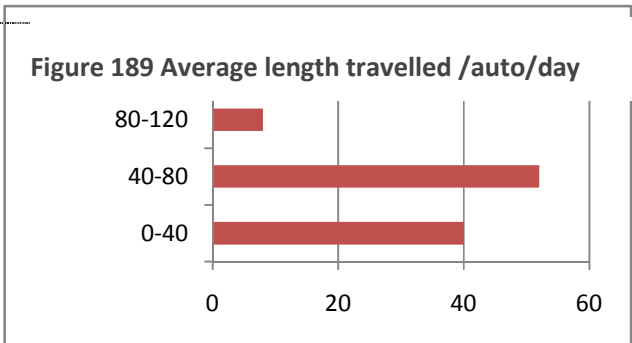




About 75 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms and only 25 % stated that the average length travelled to be between 100-150 kms. The average distance travelled per day is 87,5kms.

**d. Passengers travelled per day per auto**

It is stated that about 40% of drivers carries less than 40 passengers a day, corresponding to the 3-seater auto drivers. 52% of drivers carry between 40-80 passengers per auto per day. The increase in number is due to greater



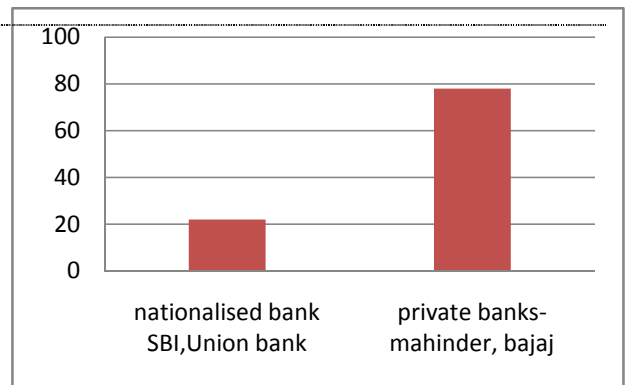
demand in certain areas like bus stand, railway stations etc. and 8% only carries more than 80-

**Figure 190 Passengers travelled per day per auto**

120 passengers per day per auto. This is the Gramin Seva which have a higher seating capacity as well as often they is overloaded with more passengers as compared to design capacity.

**e. Funding Provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents\* required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier\*\* even though the financier charges higher interest of 20 -25% as compared



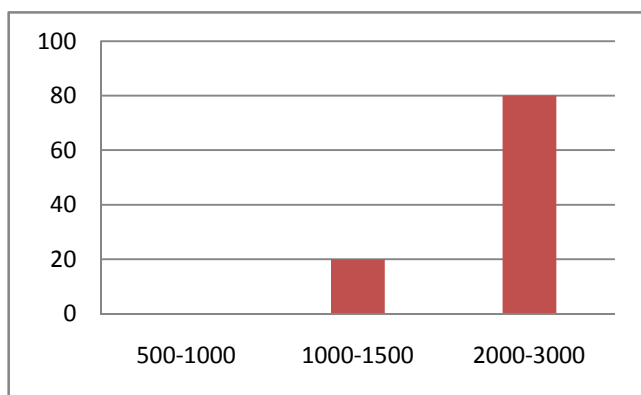
**Figure 191 Financing IPT**

to nationalised banks which charge from 10.5- 12.5%. Some of the common financiers are State Bank of India, Allahabad Bank, Bajaj finance, Canara Bank, RBI, and Kotak Mahindra Finance.

The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 78% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks even though it being a legal procedure. However the percentage of loans from the nationalised banks is higher compared to any other cities because during the time of conversions from 2 stroke to four stroke government tied up these banks and provided loans at lower interest rates.

**f. Maintenance cost of vehicles.**

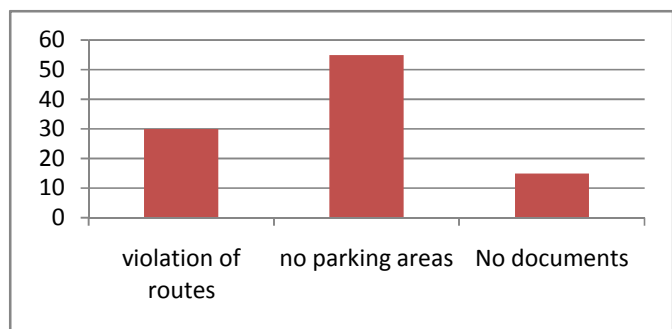
About 80 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 2000 to Rs 3000. The average cost per month is Rs 2500. The cost is higher as the maintenance cost for 4 stroke vehicles are more compared to 2 stroke. Only 20 % stated that the cost of maintenance of the vehicles per month is from Rs 1000-1500 (average Rs 1250 /month). Drivers of Gramin Seva have a higher maintenance of 3000 rupees.



**Figure 192 Maintenance cost of vehicles**

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for traffic rule violations. The major cause for fines as found from the driver survey is route violations, standing in no parking areas and sometimes absence of adequate documents as required. In rare cases, they get fined for not wearing a uniform, overcrowding the vehicles, not switching on the meter. However, the traffic penalties are often converted into a source of bribe by the city traffic



**Figure Reasons for bribes/penalties**

officials. Drivers also has to pay for their training, Rs 110 each, for getting their permits at the beginning. The total income and expenditure are given below:

**Table 2 Total income and expenditure of auto drivers**

Descriptions		Total earning per month (In Rs)	Maintenance cost/month*(In Rs)	Payment to auto unions/month (Rs)	Total expenditure /month (in Rs)	Total revenue/month (in Rs)
Income in case of rented IPT	Private services	Rs 6,750	2500	-	2500	4,250
Income in case of owned IPT	Private services	Rs 15,000	2500	-	2500	15,000
Income in case of rented IPT( profitable routes like bus stands , railway stations )	Private services	Rs 12,750	2,500	-	2500	10,250
Income in case of owned IPT( profitable routes like bus stands , railway stations )	Private services	Rs 21,000	2,500	-	2500	18,500
Income in case of rented Gramin Seva	Shuttle services	Rs 12,000	3,000	-	3,000	9000
Income in case of owned Gramin Seva	Shuttle services	Rs 27,000	3,000	-	3,000	24,000

\*average of maintenance cost per month taken

#### h. Association with unions

There are 15 registered unions in the city like Bharatiya Tipahiya Chalak Sangh (BTCS), Bharatiya Mazdoor Sangh (BMS), Nyaya Bhoomi (NGO), etc. Though unions are present but it was seen that most of the drivers are not aware of their presence. However in real terms the drivers are

not very happy associating with the trade unions as they do not provide any benefits to drivers other than organizing strikes during fare hikes.

i. **Other problems**

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1. As per the driver's survey 87 % of the drivers have obtained only primary education or are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, and education facilities.

j. **Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

**Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 85% respondents in Delhi suggested for provision of auto rickshaw stands at appropriate locations for their improvement which enables access to get passengers easily, which in turn would also reduce the hassles they have to deal with traffic police on daily basis for encroaching the roads while waiting for potential passengers at critical locations.

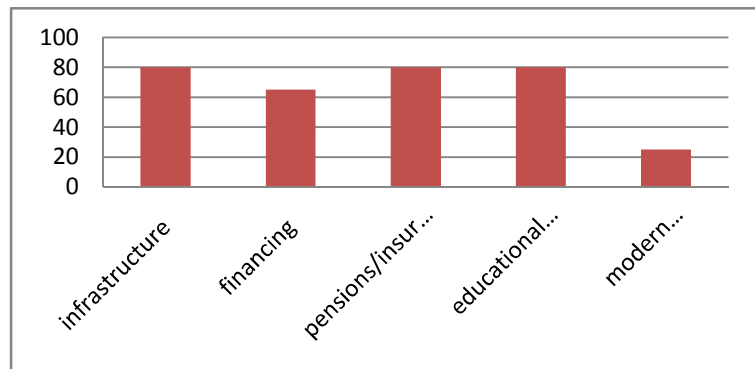
**Financing**

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out money for providing charges to unions, rent to owners etc which decreases their revenue earnings. Hence a common criteria that both the auto rickshaw drivers and unions (58%) suggested that the legal financing procedure of IPT should be made easier. And also they suggested that it would be better if government comes up with

beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

### Pensions/Insurance

About 85% of auto rickshaw driver feels that insurance should be given insurance for their future security, as the drivers are providing services to general public.



### Training Programs

About 75% of respondents in

Figure 193 Suggestions for improvement

Delhi agreed to undergo training and educational training programs for providing better service to customers.

### Usage of modern technology

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then only 45 % of the drivers suggested for such improvement to be added. This response is one of the lowest as the drivers have to shelve out money from their own pockets. So the drivers do not prefer implementation of new technologies. Delhi government made it compulsory to get the fitness certificate, and also provided subsidies to help the drivers purchase a GPS, but only few installed it.

### k. Summary of findings from drivers survey

1. A general rented auto rickshaw driver on an average earns Rs. 400- 600 per day. Also the rented autos rickshaws running on profitable routes earn between Rs 600-800 compared to the Tata Magic and the owned IPT 3 seater.(Refer table 1 & 2) This earning is considered less when compared to the Minimum Wage for the state of Delhi (

Minimum wage is Rs 11970 / month). Therefore these drivers cannot provide benefits to their family as well as lead a good life.

2. It is also seen from the survey that maintenance cost is higher for four strokes engines (average Rs 2500 per month) as the spare parts are expensive and the drivers therefore prefer to buy local parts from the markets, leading to greater number of breakdowns and faults.
3. Lack of proper infrastructure facilities like auto stands, parking areas, workshops for repairs etc.
4. Lack of proper enforcement by the traffic police for implementation of halt and go services and stands facilities for the IPT resulting in queuing at the junctions and on roads.
5. No proper interchange facilities is provided at the terminals, bus stops etc where the IPT are given facilities for halt and pick up of passengers.
6. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 20-25%. But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.
7. Since the educational levels are lower therefore computerized driving test are not possible to be given.
8. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.

## Users survey

User survey was carried out to understand the demand side of the autorickshaw service. A survey of 100 users on the basis of random sampling was carried out, at various locations. By selecting various characteristics that they associate with this IPT mode

### a. Age group of users

From the survey it has been observed that above 20 years all age groups of people use the IPT services. About 85% of the surveyed users belong to the age group 20 to 40 years. Only 10% belongs to the age group between 40- 50 years. Above the age group of 50, only 5 % uses the service. Therefore the IPT services are mostly used by the working population.

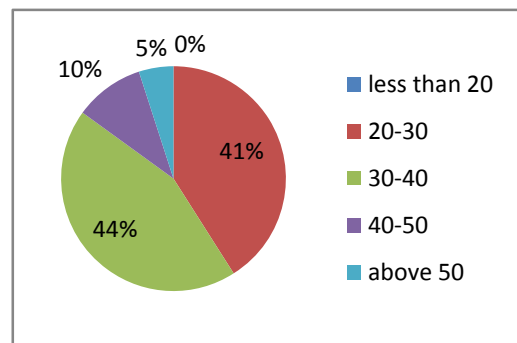


Figure 194 age profile of users

### b. Occupations of users

From the survey it is observed that maximum of the users are students (30%), followed by people working in the government sector (20%) and then private sector (15%).

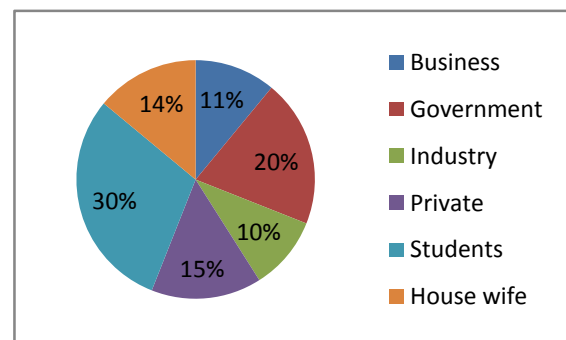


Figure 195 Occupation

### c. Purpose of trip by IPT

It has been observed that 51 % of the trip purposes for which these IPT services are used are for work purpose and 25% for

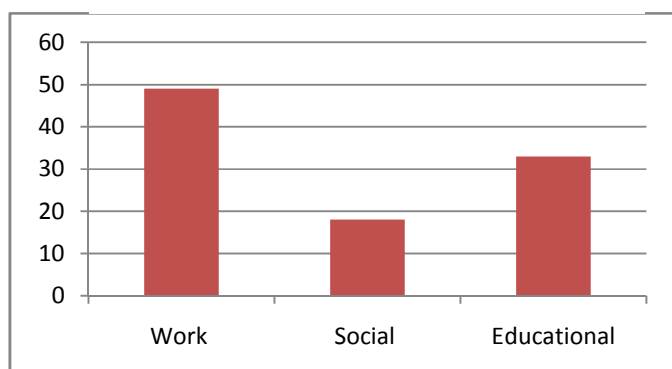
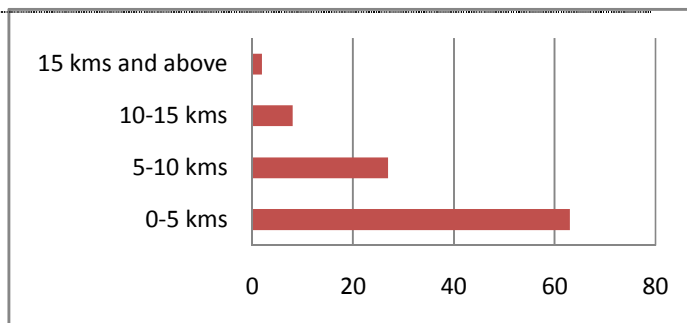


Figure 196 Trip purpose

social purpose. 35% uses for educational trips.

**d. Average distance travelled by passengers**

It has been observed that 90% of users travel by IPT for a small to medium distance trips of not more than 10 kms as autos are mainly acting as a feeder service for the metro. As a consequence, only

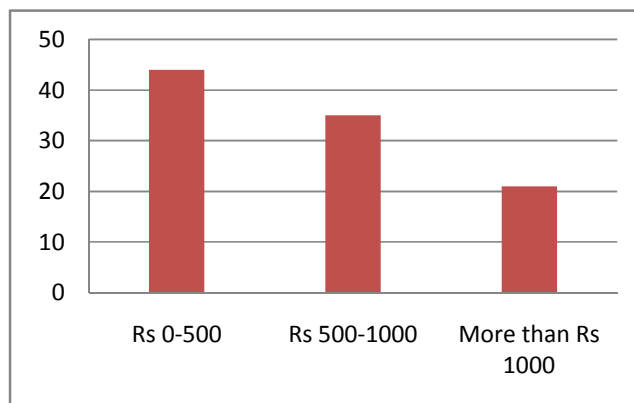


about 10% of the users travel more than distance of 10 kms and above, as those travelling to far places for job do not find PT to be comfortable.

**Figure 197 Average distance travelled by users**

**e. Expenditure per month**

From the survey it has been observed that about 80 % of users spend monthly of not more than Rs 1000 for using IPT services. This is because the passengers either travel on a shared basis, or use it for a short distance to reach the metro. Only 20 % spends more than Rs 1000, as these



passengers travel more distance and prefer not to use the metro or the bus.

**Figure 198 Expenditure per month**



**f. Safety and Security**

It has been stated that 65% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher. But another 35% of people are of the opinion that autos are safe as few autos are equipped with a GPS. It has started being implemented in Delhi, but because of the high cost and the reluctance of the drivers, it is still in minority.

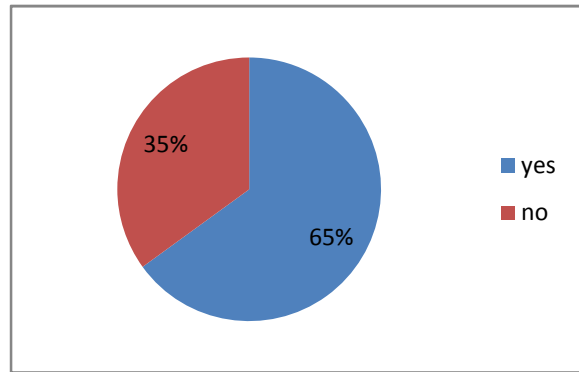


Figure 199 safety and security mechanism in IPT vehicles

**g. Reasons for usage of IPT other than Public transport**

This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

- 1. Accessibility:** Nearly 70% respondents found IPT to be more accessible. The main reason being availability of auto rickshaw whenever required at all locations, however very few are available at night and the passengers have to walk up to the main roads to get the service.

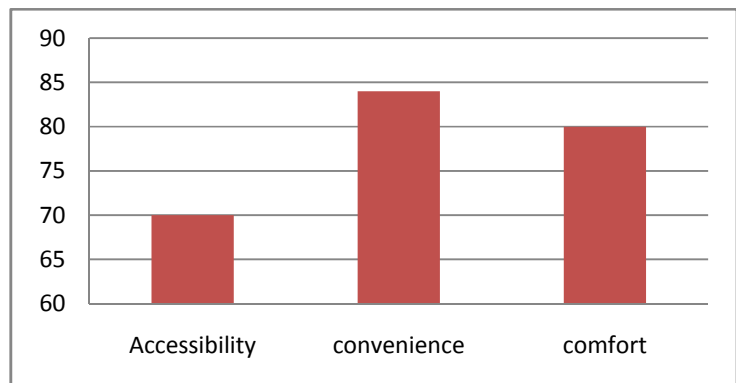


Figure 200 Reasons for usage of IPT

- 2. Convenience:** Another characteristic associated with their preference was convenience. Around 84% respondents find IPT to be more convenient again for the main reason being its easy availability. Also the waiting time for these IPT are generally lower

compared to the public transport therefore the overall journey becomes very convenient.

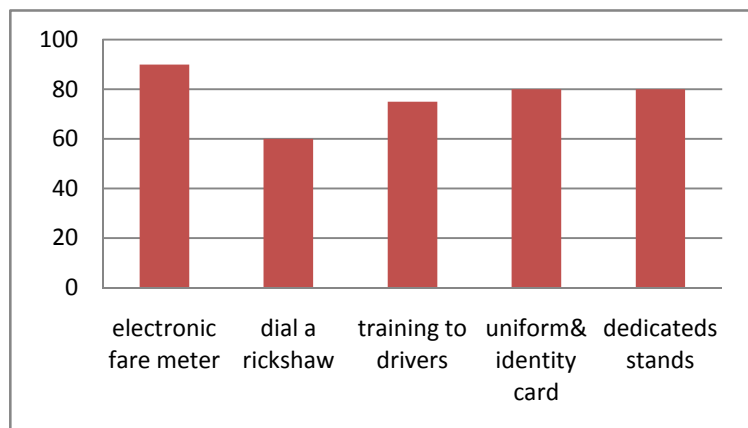
- 3. Comfortable:** Comfort was one of the important criteria that people associated with their preference for autorickshaws. Guaranteed seat, less commotion as compared to bus and easy availability and connectivity are main characteristics for comfort associated with the autorickshaw. 80% of the respondents using auto in Delhi said that it is comfortable as most autos operate privately, except the Gramin Seva in few areas. However few users complain of dis comfort as more passengers are illegally carried and due to long waiting time at stops in order to get passengers. This is the common case in case of Gramin Seva served in few areas.

#### h. Other Suggestions for organizing services of IPT

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1. Usage of modern technology- About 85% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.

2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 70% passengers are willing to use the services. The other 30% believes that there will be



extra transaction charges associated with the modern

Figure 201 other suggestions

technology used, as a result people would not prefer to use the services.

3. Training to drivers on road safety and driving skills were also agreed by about 80 % of the users. As the drivers often drive rashly according to passenger's perception.

4. 87 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion on busy roads.
5. About 85 % of users agreed that uniform dress code and identity card to all drivers make it safe for users using the service as lot of crime takes place in the city.

i. **Summary of findings from Users survey**

---

1. Charging of higher fares as the driver does not use the meter, and charges the passengers illegally.
2. Due to absence of dedicated auto rickshaw stands and parking areas often there is found chaos and congestion on roads.
3. No interchange point, making it easy to change from one mean of transport to another.
4. Lack of feeder services linking the city with the different metro stations and bus stops.
5. Auto drivers often refuse to drive the passenger to a far place, preferring to do short trips towards the nearest metro station for example.
6. In the case of Gramin Seva, carriage of more passengers as compared to the design capacity of the rickshaws, leading to dis comfort.
7. In the case of Gramin Seva, long waiting time at certain locations in search of passengers leads to dis comfort of commuters.
8. Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services at night.
9. Less availability of IPT services at night time.

# City Analysis- Bhopal

## City Profile – Background

Bhopal is the capital of the Indian state of Madhya Pradesh. It is the 16<sup>th</sup> largest metropolitan city of India. It is known as the City of Lakes for its various natural as well as artificial lakes and is also one of the greenest cities in India. Bhopal houses various institutions and installations of national importance such as ISRO's Master control facility, NIFT, IIFM, School of Planning and Architecture (SPA), BHEL, NILU etc. According to the 2011 census, the population of the Bhopal city was 1,795,648.

## Transport Scenario

Public transport system in the city comprises of organized bus service operated by Bhopal City Link Limited (BCLL). In addition, around 600 mini-buses are run by private operators. Metro or Radio Taxis and auto-rickshaws are another major means of transport. In some parts in the old as well as new city, the new Tata Magic Vans are running successfully and have replaced the older and bigger diesel rickshaws — known as "Bhat" in year 2010. Bhopal has India's longest Bus Rapid Transit System (BRTS), which became functional from the year 2013. A metro Rail project is also under implementation.

The total number of registered IPT in the city is 13,863 including Tata Magic and IPT (RTO Bhopal). The modal share for the city is 26% by bus, 8.3% by bicycle, 17.5% by IPT, 0.5% Taxis and 37.4% by private mode (BMC, 2009).

## IPT System

The type of IPT functioning in Bhopal City is

### Tata Magic (8 seater capacity) –

The city authorities in order to scrap the polluting vehicles like the tempos and Bhat as they used to be called in Bhopal, have introduced Tata Magic which are diesel operated 4 stroke vehicles. This type of auto rickshaw is the one which operates on a shared basis from one destination to another in the city on pre-decided routes fixed by RTO, Nagar nigam, Traffic

Police, Pollution Board in consultation with the auto unions working in the city. These vehicles are 8 seater and at times during peak hour carries more than 8 passengers.

### **IPT (3 wheelers)-**

This type of auto rickshaw is the commonly found auto rickshaw which operates as personally hired vehicle. It provides connectivity from one destination to another in the city on a pre-decided per km meter based fare system. They are generally used by users as an access or feeder service to the formal Public Transport system and also used as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another.

### **Regulatory Bodies**

The RTO, City traffic police and Nagar Nigam are the main authorities looking after the regulatory issues in the city.

### **Routes and fares**

The routes of 8 seater Tata Magic are fixed by the RTO, Traffic police, Pollution Board and Nagar Nigam in consultation with the auto unions working in the city. There are about 46 defined routes for Tata Magic. The total fleet size of Tata magic is 806 while the number of 3 wheeler IPT is 13,057. The routes of 3 seater IPT are not fixed and can ply throughout the city. These IPT prefer to commute passengers from specific areas, which provide them steady income.

The fares for both 3 seater auto rickshaw and 8 seater Tata Magic are fixed by the RTO. The start meter for auto rickshaw is Rs 20 for the first kilometer and increases by Rs 10 for every further kilometer travelled. The Tata Magic fares vary from Rs 5 to Rs 10.

### **Issues of permit and renewal process**

The permit for auto rickshaw and Tata Magic are issued by the RTO after the successful submission of the following documents along with a fee of Rs 200.

- Driving License
- Residence Proof

- Filled PCOP form/ Other forms
- Age Proof certificate
- Insurance certificate
- Others

The time for processing is about 3 days from the date of application. The permit has to be renewed after every 4 months, that is, 3 times in a year at a payment of Rs 200 every time. Penalties are charged according to the days of delay in the renewal process.

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and Madhya Pradesh State Motor Vehicles Rules 1994.

### **Infrastructure for IPT**

At present, there is no such robust infrastructure for IPT vehicles in the city as compared to the BRTS system. However, to reduce the traffic congestion and chaos, Bhopal Municipal Corporation has notified 110 auto rickshaw stands along with there are about 300 stands which are not notified by any Government agency. These stands are often blocked by encroachment and they queue up on roads to seek potential passengers, thus leading to congestion. Also no workshops or repair shops are provided by the government for repair and maintenance of the vehicles.

### **Vehicle characteristics**

In order to remove the polluting and noisy Bhats and tempos, the city authorities launched Tata Magic in the city. These are diesel operated 4 stroke vehicles following the BS III emission norms which are smoother and quieter in operation. On the other hand, the private 3 wheeler IPT are 2 stroke petrol operated vehicles. There are around 6% Tata Magic and 94% IPT in the Bhopal city.

### **Sample size for auto rickshaw drivers and users survey**

Surveys were carried out for drivers and users of IPT in Bhopal city. 100 surveys for drivers and users were conducted through random sampling method at some of the busiest routes and

important areas in the city. The locations surveyed were Raja Bhoj Airport, Bhopal Junction, Habibganj Railway Station, Jahangirabad, T.T Nagar and M.P Nagar.

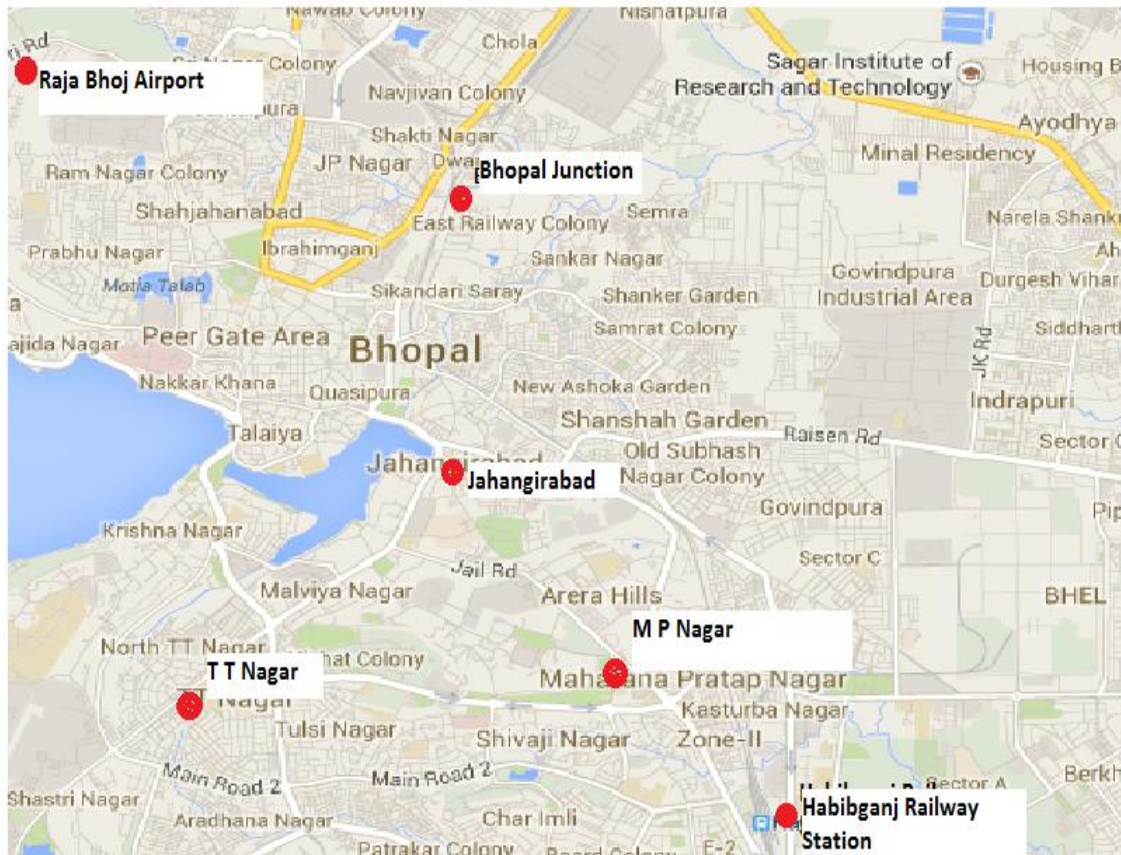


Figure 202 Survey location

### Drivers survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the city.

### a. Ownership of Vehicles

About 76% of the drivers surveyed at various locations of the city stated that they drive rented 3 seater IPT and Tata Magic vehicles and about 24% own and drive it themselves. The main reason being that they do not have enough money to purchase an auto rickshaw and purchasing it through a loan from the bank is a lengthy

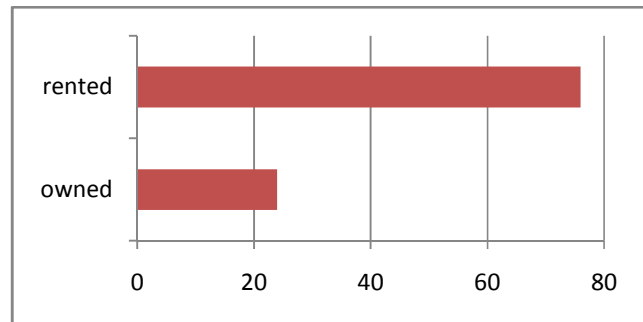


Figure 203 Ownership of vehicles

process due to much of documentation required (as mentioned in previous chapters). It is also observed that majority of the owners own about 1 to 4 IPT. The rent paid by the Tata magic and auto rickshaw drivers is Rs 250 and Rs 100 respectively per 8-12 hour of shift.

### b. Revenue earned per day

72% of the auto rickshaw drivers stated that the revenue collected per day varies from Rs 200 to Rs400. The average earning is approximately Rs 9000 per month. The rest 28% stated that the earning is between Rs 400 to

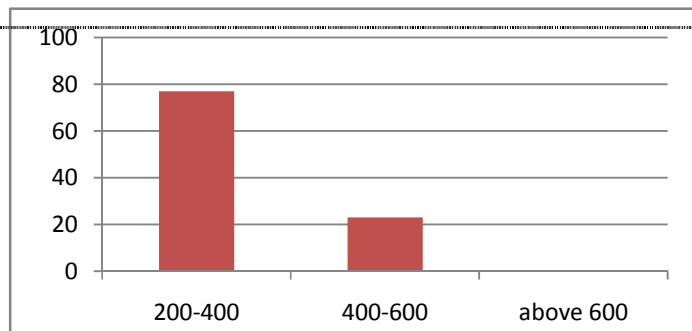


Figure 204 revenue earned by 3 seater auto

Rs 600 (Average 15000/month). The reason for this difference is the variation of passengers on the routes. There are some busy routes with more number of passengers such as railway stations and bus stands compared to other routes. In case of Tata magic, 74% of the drivers stated that the revenue per day varies from Rs400 to Rs600 while 18% stated that revenue is above Rs600 which are plying on some important routes and only 8% earned between Rs200 to Rs400.



Other than fare box revenue, renting through special events like rallies are also another source of revenue for Tata magic whereas in case of auto rickshaw school permits and advertisements add to their monthly revenues.

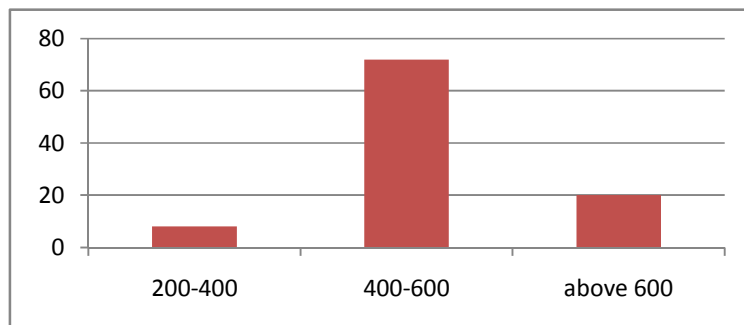


Figure 205 Revenue Earned /day by Tata Magic

Table 1 Revenue earned / month

Descriptions		Average Earning per day(Rs)	Average earning per month(Rs)	Rent/ day(Rs)	Total earning per month(Rs)
Income in case of rented IPT	Private service	300	9,000	100	6,000
Income in case of owned IPT	Private service	300	9,000	-	9,000
Income in case of rented IPT on profitable routes(near railway station and bus stands)	Private service	500	15,000	100	12,000
Income in case of owned IPT on profitable routes(near railway station and bus stands)	Private service	500	15,000	-	15,000
Income in case of rented Tata Magic	Shuttle services	500	15,000	250	7500
Income in case of owned Tata Magic	Shuttle services	500	15,000	-	15,000
Income in case of rented	Shuttle	700	21,000	250	13,500

Tata Magic on profitable routes(near Railway Station and Airport)	<b>services</b>				
Income in case of owned Tata Magic on profitable routes(near Railway Station and Airport)	<b>Shuttle services</b>	700	21,000	-	21,000
Income in case of rented auto rickshaw + school permit	<b>Private service</b>	300+ 60*	9000 + 1800	100	7,800
Income in case of owned auto rickshaw + school permit	<b>Private service</b>	300 + 60*	9000 + 1800	-	10,800
Income in case of owned auto rickshaw + Advertisement revenue	<b>Private service</b>	300+100**	9000+100	-	9,100
Income in case of rented Auto rickshaw + Advertisement revenue	<b>Private service</b>	300+100**	9,000 +100	100	6,100

\*Maximum of 5 students are allowed with a monthly fee of approximately Rs 350/ student.

\*\*Advertisement revenue at the rate of Rs 50 to Rs 100/month.

### c. Average length of the trip

About 66 % of the drivers stated that the average length travelled by auto per day is between 50-100 kms , about 28% stated that their trips are between 100 to 150 km and only 6 % stated that the average

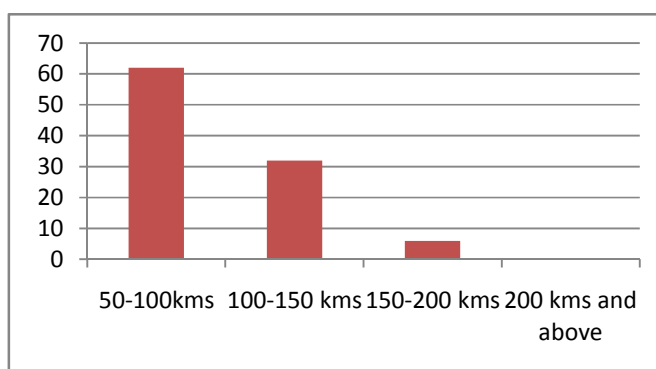


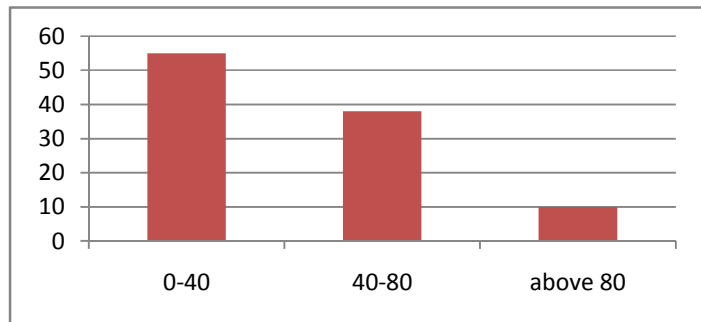
Figure 206 Average length of the trip travelled by auto

length travelled to be between 150-200kms. These long distance travel trips

cater to the routes which are extending beyond the city limits on the outskirts usually for the daily wage earners who come to the urban areas for employment opportunities. Also these long distance trips are by the Tata Magic which ply on some long routes.

**d. Passengers travelled per day per auto**

It is stated that about 55% of the drivers carry up to 10 to 15 passengers per day, as these are usually private 3 seater IPT. On the other hand, around 42 % of the drivers carry approximately 50 to 70 passengers per

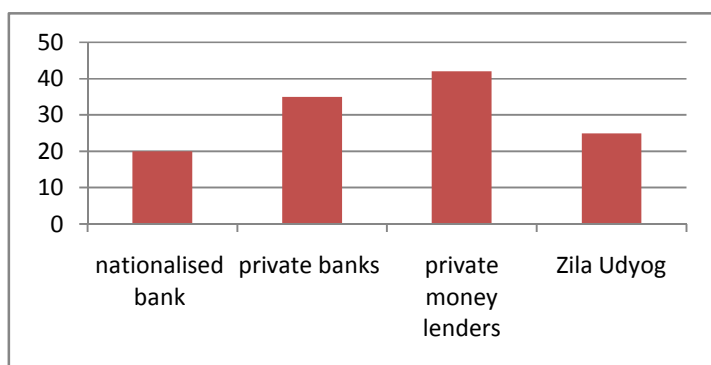


**Figure 207 Passengers travelled per day per auto**

day as these are Tata Magic providing shared services on the pre-defined routes and therefore have more number of passengers and only 10% of the drivers carry more than 70 passengers per day because they are catering to some busy routes such as those of Railway station and Airport.

**e. Funding provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy and tedious process. Also, many times the driver does not possess all the necessary documents (refer to previous chapter) required by the banks to finance the loan. Hence the



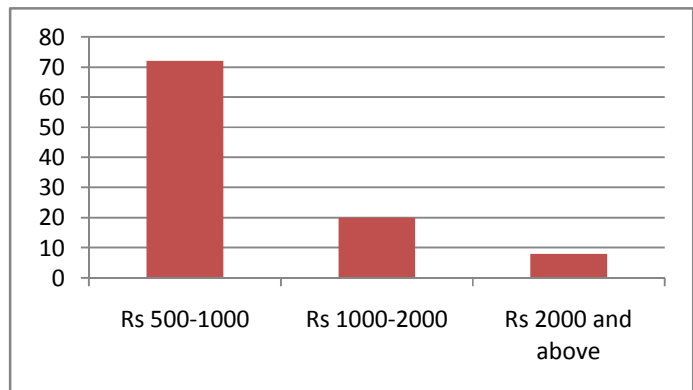
**Figure 208 Financing IPT**

driver feels it easy to resort to a private financier even though the financier charges higher rate of interest of 20 -25% as compared to nationalised banks which charge from 10.5- 12.5%. Some of the common financiers are State Bank of India, Zila Udyog Parishad along with other private financiers. They also get finance through some nationalised schemes such as Swarna Jayanti Yojna, Pradhanmantri Rozgar Yojna, etc. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without much paper work. Thus, the graph shows that due to the above mentioned reasons nearly 42% of the auto rickshaw drivers

prefer financing through private money lenders rather than approaching banks. About 35 % get loans from the private banks, about 25% through Zila Udyog Parishad as they get some benefits by them and only 20% through nationalised banks.

**f. Maintenance of vehicles**

In Bhopal, there are usually 2 stroke 3 wheeler IPT. About 72 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 500 to Rs 1000. The average maintenance cost per month is Rs 750.



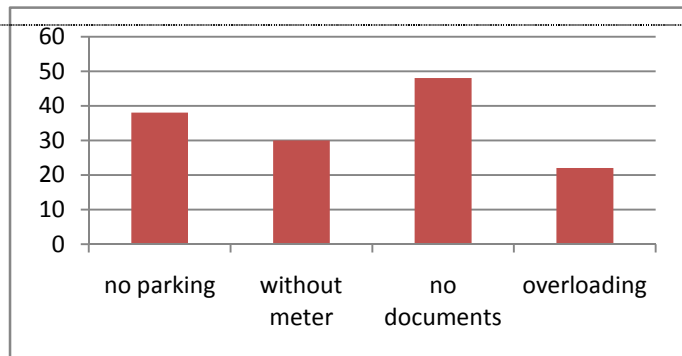
**Figure 209 Average maintenance cost/ month**

20% stated that the cost of maintenance of the vehicles per month is from Rs

1000 – Rs 2000 (average Rs 1500/month) and about 8% stated more than Rs 2000. The reason for increase in maintenance cost is due to the 4 stroke engines and other expensive technology being used in the Tata magic compared to normal three wheeler auto running on Petrol.

**g. Other charges/bribes/penalties**

Fine and penalties are charged on auto drivers by the traffic police and RTO's mainly for overloading of passengers, vehicles without permit or documents, unauthorized parking, operating without meters, etc. About 22% of the autos are fined for overloading. 48% are fined for incomplete documents and



**Figure 210 Reasons for bribes/penalties**

about 68% for other reasons such as unauthorized parking and operating without meters. The penalties are usually Rs100 for such violations. However the traffic penalties are often converted into sources of bribe for the city traffic officials. The total income and expenditure are given below:

Table 2 Total income and expenditure of auto drivers

Descriptions		Total earning per month(in Rs)	Maintenance cost/ month(In Rs)	Payment to police /month (Rs)	Total expenditure /month (in Rs)	Total revenue/ month (in Rs)
Income in case of rented IPT	<b>Private service</b>	6,000	750	-	750	5,250
Income in case of owned IPT	<b>Private service</b>	9,000	750	-	750	8,250
Income in case of rented IPT on profitable routes(near railway station and airport)	<b>Private service</b>	12,000	750	-	750	11,250
Income in case of owned IPT on profitable routes(near railway station and airport)	<b>Private service</b>	15,000	750	-	750	14,250
Income in case of rented Tata Magic	<b>Shuttle services</b>	7,500	1500	-	1500	6,000
Income in case of owned Tata Magic	<b>Shuttle services</b>	15,000	1500	-	1500	13,500
Income in case of rented Tata Magic on profitable routes(near Railway Station and Airport)	<b>Shuttle services</b>	13,500	1500	-	1500	12,000
Income in case of owned Tata Magic on profitable routes(near Railway Station and Airport)	<b>Shuttle services</b>	21,000	1500	-	1500	19,500
Income in case of rented auto rickshaw	<b>Private</b>	7,800	750	-	750	7,050

+ school permit	<b>service</b>					
Income in case of owned auto rickshaw + school permit	<b>Private service</b>	10,800	750	-	750	10,050
Income in case of owned auto rickshaw + Advertisement revenue	<b>Private service</b>	9,100	750	-	750	8,350
Income in case of rented Auto rickshaw + Advertisement revenue	<b>Private service</b>	6,100	750	-	750	5,350

#### h. Association with unions

There are 3 to 4 auto unions registered under the Trade Union Act, namely New Bhopal Auto Association, Fans club Auto Union, Ekta auto union, etc working for the private auto rickshaw as well as for the shared Tata Magic services. The unions provide benefits in official matters like renewal of permits, getting loans sectioned for new vehicles and act as mediators in case of disputes. The unions also provide legal support to its members. However in real terms the drivers are happy associating with the trade unions as these provide benefits to drivers but there are no social benefits being provided to the drivers such as medical facilities, insurance, educational facilities, etc.

#### i. Other problems

1. As per the driver's survey 67 % of the drivers have obtained education up to 8<sup>th</sup> standard, 20% up to 8<sup>th</sup> standard and only 2% are graduate and above and 4% are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. The fares are not revised regularly with the increase in the prices of petrol and diesel.
3. The problems are also associated with the overlapping of routes of Tata Magic with that of BRTS system.

4. The drivers also stated that there is a lack of designated parking areas at various locations due to which they often have to pay fines/penalties/bribes to the police.
5. Most of the drivers stated that the auto business has reduced due to the introduction of efficient BRTS system in the city and therefore suggested to separately define the routes for IPT so that auto drivers can earn proper livelihood.

j. **Other suggestions like financing assistance, provision of infrastructures, social benefit schemes**

In the driver survey, various suggestions were given in order to make their operations and socio-economic conditions better.

### **Infrastructure**

The drivers were asked to give their opinions on what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. About 67% respondents in Bhopal suggested for provision of parking areas and separate routes for IPT so as to avoid overlapping with Bus system. However, the stands have been provided by the government with specified number of autos at each stand but there is a lack of enforcement due to which it often results in traffic chaos and quarrels.

### **Financing**

As mentioned earlier owning a new auto rickshaw is not an easy option for drivers as financing procedures are quite lengthy and tedious. The drivers have to shelve out money for providing charges to unions, rent to owners, etc. which decreases their earnings. Hence, both the auto rickshaw drivers and unions (72%) suggested that the financing procedure of IPT should be made easier and loans should be provided at a lower rate from the banks.

## Pensions/Insurance

About 70% of auto rickshaw driver feels that insurance should be given for their future security, as the drivers are providing services to general public and helping in a social cause. They also suggested that there should be laws supporting the drivers in case of passengers misbehaving with them.

## Training Programmes:

About 60% of respondents in Bhopal agreed to undergo training and educational training programmes for providing better service to customers. However training programmes are being conducted by auto unions from time to time at an interval of 3 to 4 months through Nukkadnataks, etc.

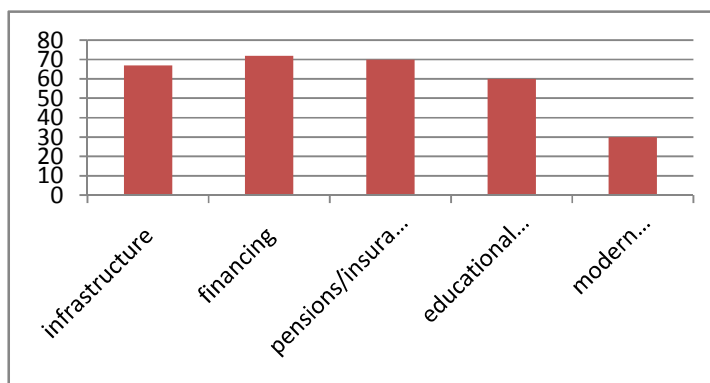


Figure 211 Suggestions for improvement

## Usage of modern technology

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then only 30% of the drivers suggested for such improvement to be added. The reason for less percentage is due to the fact that drivers have to bear the extra cost burden of installing new technology.

### k. Summary of findings from the drivers survey

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1. From the survey it was found that the rented IPT and Tata Magic are the worst sufferers as these drivers cannot provide better future to their families because the earning is below the mentioned minimum wage level for the state i.e. Rs 7,068/month (Refer table 1 & 2).



2. It is also seen from the survey that the auto rickshaw business has reduced to some extent due to the introduction of BRTS system in the city which has significantly affected the revenue of the auto rickshaw drivers.
3. It is also found that there is a problem of route rationalization because of the overlapping of bus routes with that of IPT.
4. Lack of proper infrastructure facilities like parking areas, rest rooms, workshops for repairs etc.
5. It is also seen from the survey that maintenance cost is higher for Tata Magic (average Rs1500 to Rs 2000/month) and therefore the drivers use local parts for replacements often leading to frequent breakdown in services.
6. It is also found that there is a problem of regular revision resulting in clashes between unions and authorities.

## User Survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 100 users on the basis of random sampling was carried out, at various locations. of city, rural and other routes by selecting various characteristics that they associate with this IPT mode.

### a. Age group of users

From the survey it has been observed that all age groups of people use the IPT services. About 66 % of the surveyed users belong to the age group 30 to 50 years. 35 % belongs to the age group up to 30 years and only 8% of users above the age group of 50. Therefore, we conclude that the IPT services are mostly used by the working population and to some extent by the college going students.

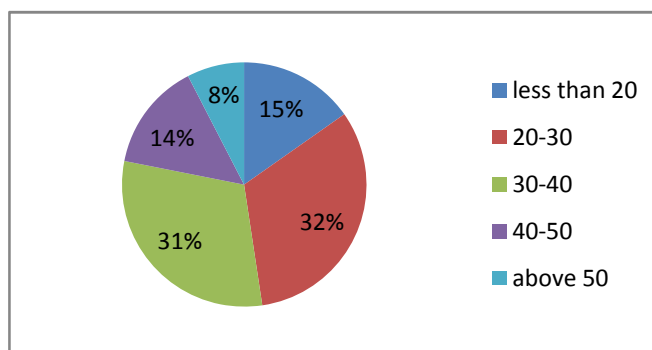


Figure 212 age profile of users

### b. Occupation of users

From the survey it is observed that more than 40 % of the users belong to the private firms. About 22% of the users are government employees, students account for 18% and 16% housewives. However around 14 % of people are having their own business in the city.

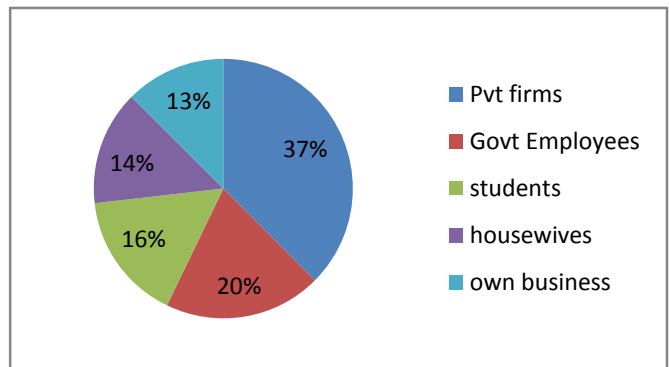


Figure 213 Occupation of users

### c. Purpose of trip by IPT

It has been observed that 54 % of the trips are for work purpose and 24% for social purpose. About 18% uses for educational trips as there are many educational institutions in Bhopal and 4 % uses for some other purpose such as health care.

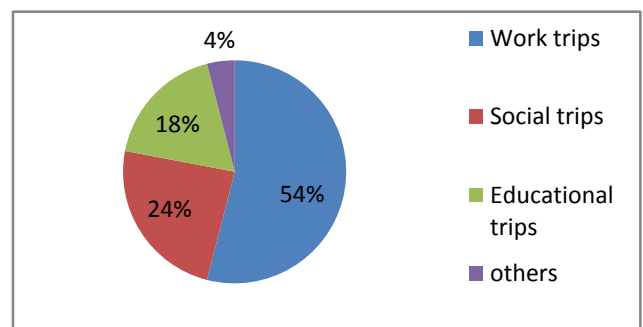


Figure 214 Trip purpose

### d. Average distance travelled by passengers

It has been observed that since Bhopal is a big diversified city about 70% of the distance travelled by IPT varies from 2 to 10 km. However, people

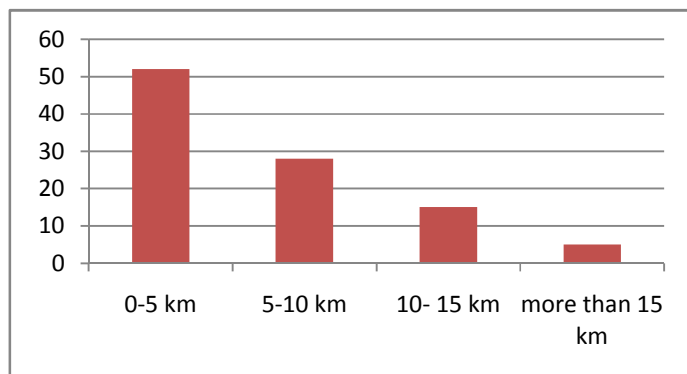


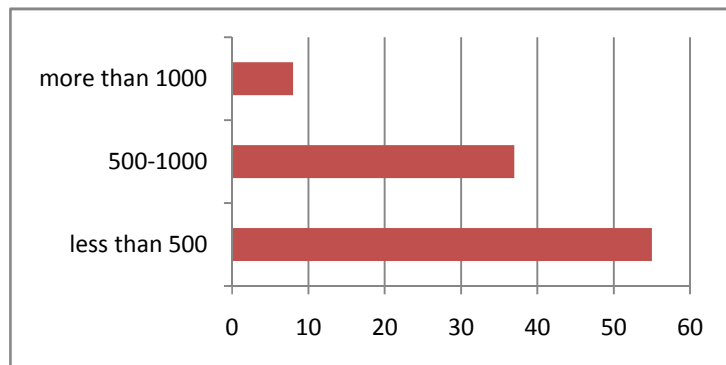
Figure 215 Average distance travelled by users

prefer to use the BRTS services for long distance travel. Only 15% prefer to use

Tata Magic for more than 10 km of distance and that too on routes where Bus service is not available.

#### e. Expenditure per month

From the survey it has been observed that about 55 % of users spend monthly up to Rs 500 as mostly the three wheeler IPT are preferred for short distance travel



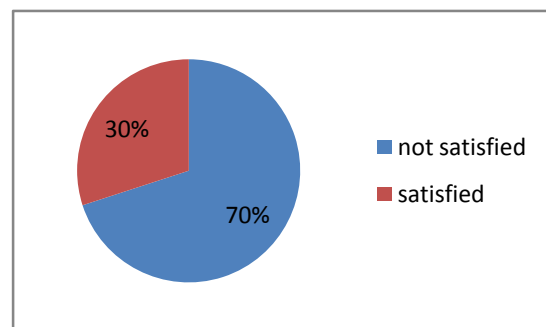
and 42 % spend Rs 500 to Rs 1000. However, only 7% spend more than

Figure 216 Expenditure per month

Rs 1000 as long distance travel. The reason for less expenditure on IPT services is the introduction of Bus Rapid Transit system in the city which is preferred over IPT.

#### f. Safety and Security

It has been observed that 70% of the users are not satisfied with the safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher especially for



females and elderly. Overloading of

vehicles by the drivers is also a major

Figure 217 safety and security mechanism in IPT vehicles

safety and security concern which often leads to accidents.

#### g. Reason for usage of IPT other than Public Transport

This criterion was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. The following are the characteristics associated for the usage of IPT.

- 1. Accessibility:** Accessibility of IPT was found to have been the most likely reason for preference over public transport. Around 72% of the respondents stated this reason as the 3 seater auto rickshaw can be found easily at every corner of the street. However, there are issues related to meter as most of them do not run on meter.

**2. Convenience:** Another characteristic associated with their preference was convenience. Around 58% respondents find IPT to be more convenient again for the main reason being its easy availability. . Also the waiting time for these IPT are generally lower compared to the public transport therefore the

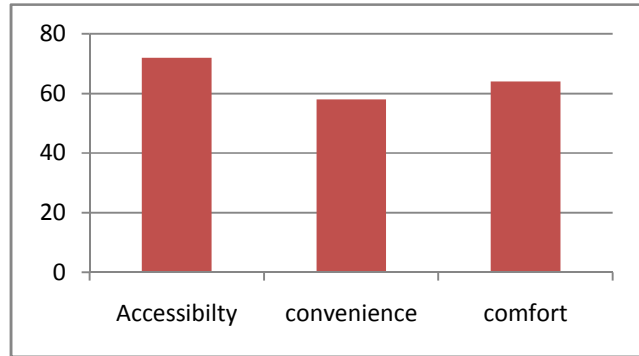


Figure 218 Reasons for usage of IPT

overall journey becomes very convenient. However the rest of the users are of the opinion that the waiting time in case of Tata Magic is higher.

**3. Comfort:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus and easy availability are main characteristics for comfort associated with the auto rickshaw. 64 % of the respondents using the service in Bhopal said that it is comfortable. However 36 % complains of dis comfort as more passengers are illegally carried in Tata Magic and inefficient meter system in IPT.

**h. Other suggestions for organizing the services of IPT**

1. Usage of modern technology- Though fares are fixed but are often bargained by the users and operators. Therefore, about 78% of the users suggested the usage of modern technology like providing GPS metered electronic fare system so that drivers do not charge illegally. The GPS would also enhance the accessibility and easy tracking of the IPT.

2. When users were made aware of the usage of panic button, dial a rickshaw services then

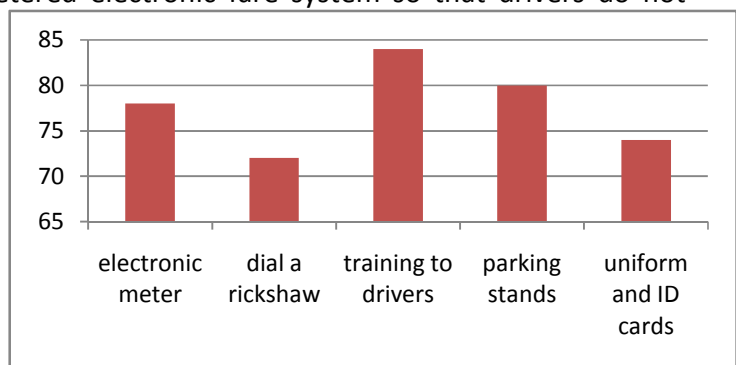


Figure 219 Other suggestions

about 72 % passengers were willing to use the services. The other 28% believes that it would lead to extra transaction charges and are not much aware of the modern technologies.

3. Training to drivers on road safety and driving skills were also agreed upon by about 84 % of the users. As the drivers often drive rashly according to passenger's perception.
4. 80% of the users suggested to build the dedicated parking areas for IPT as their illegal parking on the streets create traffic congestion and chaos.
5. About 74% of users agreed that uniform dress code and identity card to all drivers to make it safe for users using the services for easy identification of the drivers.

i. **Summary of the findings from the user survey**

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1. From the users' survey, it is found that drivers are often reluctant to go by meters and charge a lump sum amount.
2. Safety and security mechanisms are missing therefore the users especially females and elderly do not feel safe to use the services after evening.
3. Long waiting time for the shared services at certain locations in search of passengers leads to discomfort of commuters.
4. Non availability of IPT services at night is also a major issue for commuters going to railway stations or in case of emergency.

# City Analysis- Bengaluru

## City Profile - Background

Bengaluru, the Capital of Karnataka, is the fifth largest metropolitan city in the country in terms of population. BBMP now spans over an area of 800 sq km. Bangalore is well known nationally and internationally as a destination of choice for high-tech industries, particularly in the IT/ITES and Biotechnology sectors. It is a city that has transformed itself from a “pensioners’ paradise” to a modern thriving cosmopolitan metropolis. The pleasant climatic conditions, and the “garden city” image, as well as the availability of academic institutions and skilled workforce have led to this rapid development. It is divided into 198 wards owing to the delimitation regulations. It has a population of 10,178,146(Census, 2011).

## Transport scenario

There are a wide variety of transport modes used in Bengaluru -Cars, 2 wheelers, bicycles. IPT (3 wheeled) , city bus service(4185 in operation) and a metro rail service issued to meet daily travel needs of the residents of Bengaluru.

The total number of registered IPT in the city is approximately 1.59 lakh (RTO, Bengaluru, 2013). The modal share for the city of Bengaluru shows that 8% trips are made by walking, 2.22% on bicycle, 11.56% by autorickshaw, 41.91% by Public transport(PT) and around 35.98% by private motorized transport (Wilber Smith Report ,2008).

## IPT System

The type of IPT functioning in Bengaluru is

### Auto rickshaw (3 seater capacity) –

This type of auto rickshaw is the commonly found auto rickshaw’s operating on-demand, private hire basis. These run from anywhere to anywhere, providing near ‘door to door’ connectivity. Some informal (illegally-run) ‘shared auto service’ i.e. with fixed routes and per head fares, do exist within certain pockets of the city-which generally tend to be areas either

not well served by formal public transport modes or do not meet the needs of different population. These either run parallel to public transport routes providing point to point services or in some cases feeder services to public transport. The IPT in the city can move only inside an circle of 25kms pre-decided by the regional transport authority (RTA).

### **Regulatory bodies**

The RTA and City traffic police are the main authorities looking after the regulatory issues in the city. There are two RTA offices in Bangaluru one being for the urban area and other being for the rural area. The RTO (Regional transport office) in the city works on the direction of the RTA and is responsible for conducting tests and issue of auto cab driving license and badge, new vehicle passing and registration, periodic vehicle fitness test and certification, transfer and renewal of permits, etc. Though aware, of the three wheeler system prevailing in the city, the authorities are not stringent about the violations and the number of illegal IPT that are running in the city.

### **Routes and fares**

The RTO has no fixed any of the routes as shared auto rickshaw service is banned in the city.

The fare structure is fixed by the Regional transport Authority (RTA). The revision of fare is done based on increase in cost of LPG gases, but not on a regular basis. The fare charged is Rs 25 for first 1.9 km and after 2 km fare charged is Rs 14/km. The IPT in the city are metered, but the drivers generally do not run on meters. It becomes very hard for a tourist or an outsider in the city to travel in the metered auto since the drivers do not understand any other language other than the local language.

### **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.500 along with the following documents:

- Filled application form to the Regional Transport Officer.
- Residence Proof

- Age proof certificate
- Insurance certificate
- Filled PCOP form
- Driving license

The time taken for processing is about 15-30 days from the date of application. The permit is renewed after every 5 years at a payment of Rs 500. Penalties are charged according to the delay in the renewal process (Rs 400 after 1 year delay, Rs2500 after 2 year delay and Rs3500 after 3 year delay).

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and Karnataka State Motor Vehicles Rules.

### **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. No IPT stands or dedicated tracks have been provided in the city. The stands that are found in the city are demarcated by the auto unions themselves based on the availability of road space on each route, resulting in queuing at critical junctions and thus contributing to congestion levels. Also no workshops or repairing shops are provided for repair of IPT Vehicles.

### **Vehicle characteristics**

In an effort to shift to cleaner fuel technology, in 2005-06 the state government mandated the conversion of all autos to LPG. A few years later it was decided to stop the entry of 2 stroke autos into the market. The ban that came into the effect on 30th December 2008 in Bangaluru was extend to all of Karnataka in 2010.As such , 2 stroke autos are no longer allowed or registered in the city. As per the current rule, all new auto rickshaw cabs in Bangaluru have to be 4 stoked ,with built in LPG kits, flag-down digital/electronic meters green in colour. They all have 'contract carriage' permit for 3+1 seater.



## Sample size for Auto rickshaw drivers and users survey

Surveys were carried out for drivers and users of IPT in the city of Bengaluru. 100 surveys for drivers and user were conducted through random sampling method at few of the locations based on the busiest, medium and low used routes of city. Survey locations are Yeshwantpur Metro station, Mahalakshmpuram, Ashokapuram, Malleshwara, Gayatrinagar, Shivajinagar, Srirampura metro station, Funworld, Bangalore palace, Cantonment Railway. Station.

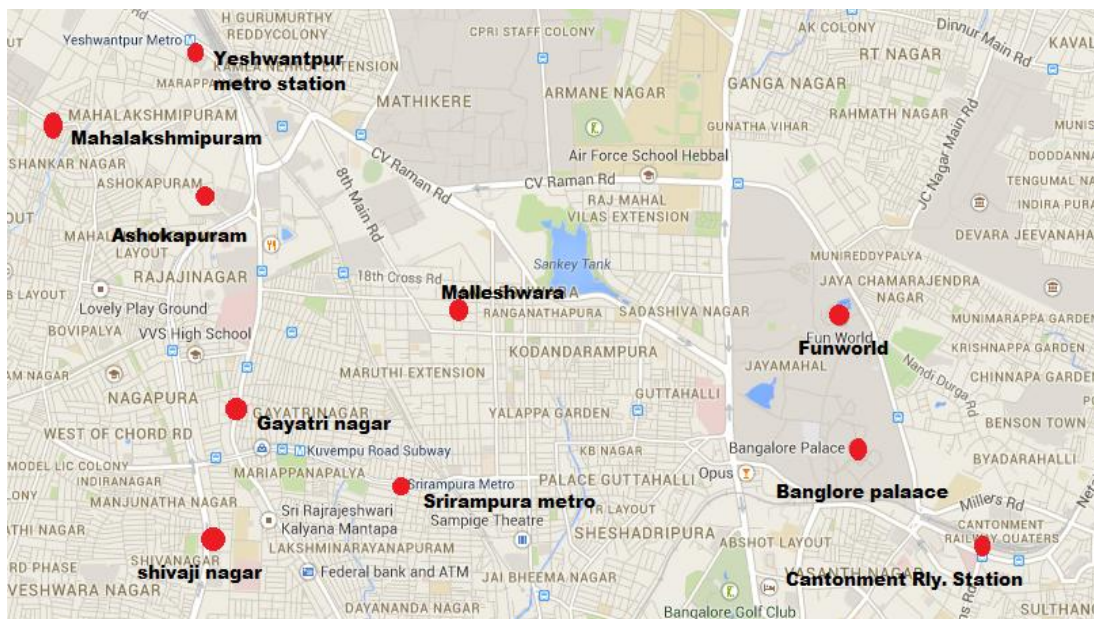


Figure 220 Survey Locations

## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

**a. Ownership of Vehicles**

About 70% of the drivers surveyed at various locations of the city stated that they have rented the auto rickshaw they drive. Ownership in Bengaluru is 30%. One of the major reasons of this trend is the lengthy and tedious process of purchasing an auto rickshaw through a loan from bank due to too much documentation required.

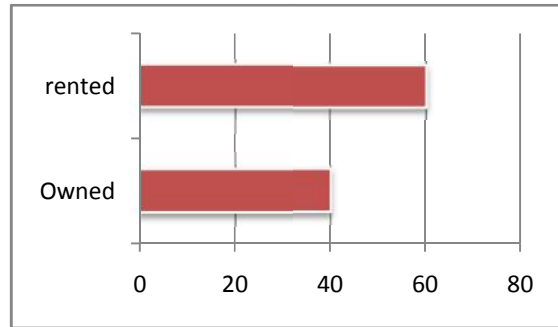


Figure 221 Ownership of vehicles

It is also observed that out of the owners majority owns about 2-4 IPT. Also the rent paid by the drivers to their owners is Rs 200 daily.

**b. Revenue earned per day**

54% the drivers stated that the revenue collected per day varies between Rs300 to Rs500 (avg. 12,000/ month) whereas 36% of the total respondents said that the revenue they collected varies between Rs500-700. The average earning per month is Rs 18,000, whereas 10% of the drivers said that they generally earn more than Rs700 per day.(Avg.24,000/ month).The higher income are attributed to profitable routes.

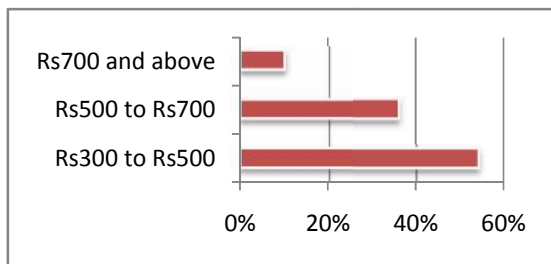


Figure 222 Revenue earned per day-3 seater auto

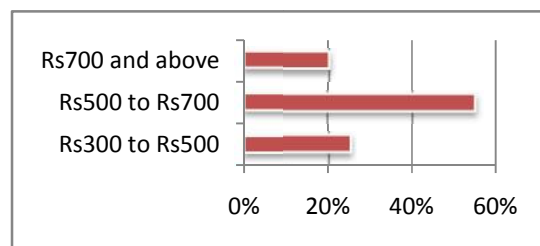


Figure 223 Revenue earned per day(illegal shuttle service)

10% of the drivers who run their auto on shared basis though banned said that they earned between Rs300-Rs500 whereas 65% earned between Rs500-Rs700 and 25% of them earned more than Rs700. The higher income is attributed to profitable routes.

Other than fare bus revenue no other permission for revenue generation like advertisements, rallies, schools are given by the government. Comparative table showing earning of rented and owned IPT are given below:

**Table 1 Revenue earned per month**

Description		Average earnings (Rs)	Average earnings per month(Rs)	Rent/day (Rs)	Total earnings per month(Rs)
<b>Income in case of rented auto rickshaw</b>	Private service	400	12000	200	6000
<b>Income in case of owned auto rickshaw</b>	Private service	400	12000		12000
<b>Income in case of rented auto rickshaw running on profitable routes</b>	<b>Private service</b>	750	22500	200	16500
<b>Income in case of owned auto rickshaw running on profitable routes</b>	<b>Private services</b>	750	22500		22500
<b>Income in case of rented auto rickshaw</b>	Shuttle service	600	18000	200	12000
<b>Income in case of owned auto rickshaw</b>	Shuttle service	600	18000		18000
<b>Income in case of rented auto rickshaw running on profitable routes</b>	Shuttle service	850	25,500	200	19,500
<b>Income in case of owned auto rickshaw running on profitable routes</b>	Shuttle service	850	25500		25500

**c. Average length travelled by auto per day**

22% of the total respondents said that they travel a total of about 70-100 kms per working day, 44% said 100-120 kms, 23% said 121-150 kms and about 11% run more than 150 kms.

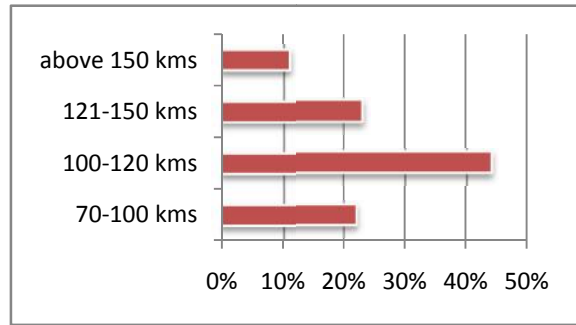


Figure 224 Average length travelled /auto/day

But the above stats depended on whether one prefers to roam and run more empty kilometers looking for passengers, or save fuel expenses and wait empty for longer duration on the stands.

**d. Passengers travelled per day per auto**

It is stated that about 32% of drivers carries between 15-20 passengers per auto per day. Only 6% carries more than 30 passengers per day per auto, this is due to overloading of passengers. On few occasion this number can fall to less than 10 passengers, but this rarely happens.

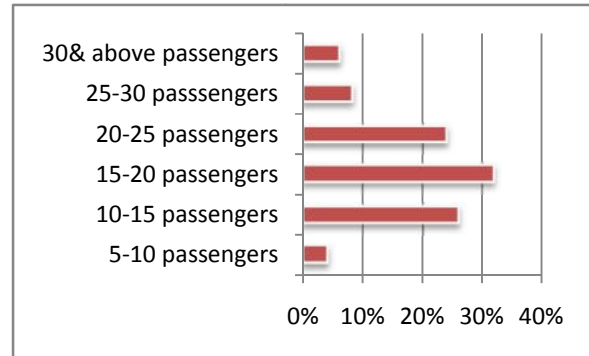


Figure 225 Passengers travelled per day per auto

**e. Funding Provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents\* required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier\*\* even though the financier charges higher interest of 20 -25% as compared to nationalised banks which charge

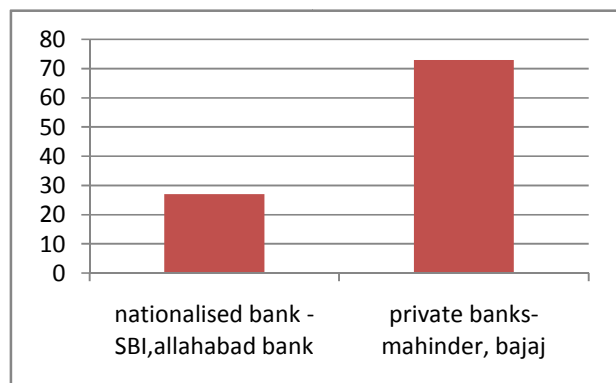


Figure 226 Financing IPT

from 10.5- 12.5%. Some of the common financiers are State Bank of India, Allahabad Bank, Bajaj

finance and Kotak Mahindra Finance. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 73% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks even though it being a legal procedure.

Three wheels united (TWU) is an organization that is helping the auto drivers in Bengaluru in several ways. The financial services provided by the enterprise for the poor drivers include financing ownership of four-stroke vehicles, helping them open savings bank accounts and providing them with life and health insurances. The financial model followed is beneficial to the economically poor drivers. The bank contributes 90% of the vehicle cost and the drivers are expected to contribute 10%. The TWUISPL gives 15% of the vehicle cost as guarantee. The drivers are then expected to repay the amount in daily installments for 26 days a month for 60 months. In cases of non-compliance, the auto rickshaw is seized back. The TWUISPL has recognized some additional revenue generation means for the drivers. These include revenue generation through advertisements in IPT, micro franchise schemes such as mobile recharging and increased ridership through mobile based applications. The advertisement revenue has provided for life insurance for the drivers and the franchise scheme has helped drivers take up entrepreneurial roles. Though such a kind of organization exists but not all drivers is aware of its benefits and only a few of the autos are registered along with it.

**f. Maintenance cost of vehicles.**

About 81 % of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 1000 to Rs 2000 as these drivers use good quality spare parts for maintenance of vehicles .The average maintenance cost per month is Rs1500.17 % stated that the cost of maintenance of the vehicles per month is from Rs 500-Rs 1000

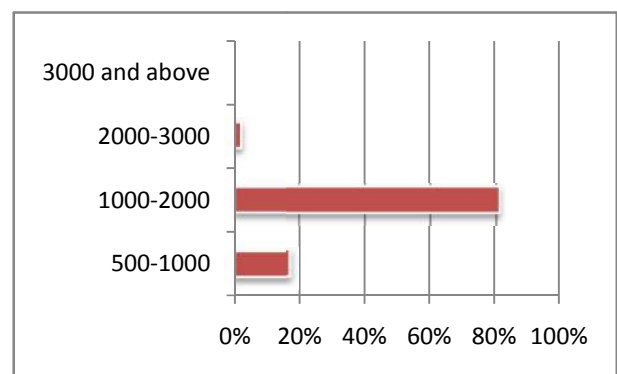


Figure 227 Maintenance cost per month

(average Rs 750 /month). About 2% of the auto drivers said that their maintenance cost ranged between Rs2000 to Rs3000. However, the results look to be on the higher side as it is not clear whether the auto drivers excluded the oil costs while quoting these figures.

**g. Other charges/bribes/penalties**

The traffic police levy fines on auto drivers in cases of traffic violation. Absence of adequate documents and standing in no parking areas were the major causes for fines according to the driver's interview conducted.



**Figure 228 Reasons for bribes/penalties**

However, the traffic penalties are often converted into a source of bribe by the city traffic officials. Due to standing in no parking areas therefore charge of Rs 200 is charged from drivers. In case of absence of documents the drivers are charged Rs300.

**Table 2 Total income and expenditure of auto drivers**

Description		Total earnings per month (Rs)	Maintenance cost (Rs)	Fines and penalties	Total expenditure (Rs)**	Total Revenue per month (Rs)
Income in case of rented auto rickshaw	Private service	6000	1583	400	1983	4017
Income in case of owned auto rickshaw	Private service	12000	1583	400	1983	10017
Income in case of rented auto rickshaw running	Private service	16500	1583	400	1983	14517

<b>on profitable routes</b>						
<b>Income in case of owned auto rickshaw running on profitable routes</b>	<b>Private services</b>	22500	1583	400	1983	20517
<b>Income in case of rented auto rickshaw</b>	Shuttle service	12000	1583	400	1983	10017
<b>Income in case of owned auto rickshaw</b>	Shuttle service	18000	1583	400	1983	16017
<b>Income in case of rented auto rickshaw running on profitable routes</b>	Shuttle service	19,500	1583	400	1983	17517
<b>Income in case of owned auto rickshaw running on profitable routes</b>	Shuttle service	25500	1583	400	1983	20517

\*average of maintenance cost is taken Rs1583 per month

#### **h. Association with unions**

There are 5 big auto union and about 70 smaller groups of auto union registered in the city. The big ones being ARDU-CITU, Adarsh Auto and Taxi driver union, Jai Karnataka, Jai Bhuvaneshwarto name a few. ARDU-CITU charges Rs 36 per year and members are given a red badge with their name and serial number on it for Rs15. Adarsh union charges Rs 100 per yer whereas Jai Karnataka charges only Rs10 per year. However in real terms the drivers are not very happy associating with the trade unions as they do not provide any benefits to drivers other than organizing strikes during fare hikes.

Three wheels united (TWU) is a Bangaluru based social enterprise. TWU's aim for the auto rickshaw project is to better the lives of over 1 million auto rickshaw drivers in India over the next 10 years. It aims to ensure a path for holistic development both economically and socially as well as being environmental friendly with greener 4 stroke IPT.

**i. Other problems**

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1. As per the driver's survey 90 % of the drivers have obtained only primary education or are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, and education facilities.
3. Finance rates are too high in banks.
4. The parking facilities are not adequate in the city and thus the drivers park their vehicles in restricted areas and thus have to pay fines.
5. The police officials and passengers do not give adequate respect to the auto drivers

**j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

**Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 80% respondents in Bangaluru suggested for provision of auto rickshaw stands at appropriate locations for their improvement which enables access to get passengers easily, which in turn would also reduce



the hassles they have to deal with traffic police on daily basis for encroaching the roads while waiting for potential passengers at critical locations.

### Financing

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out money for providing charges to unions, rent to owners etc

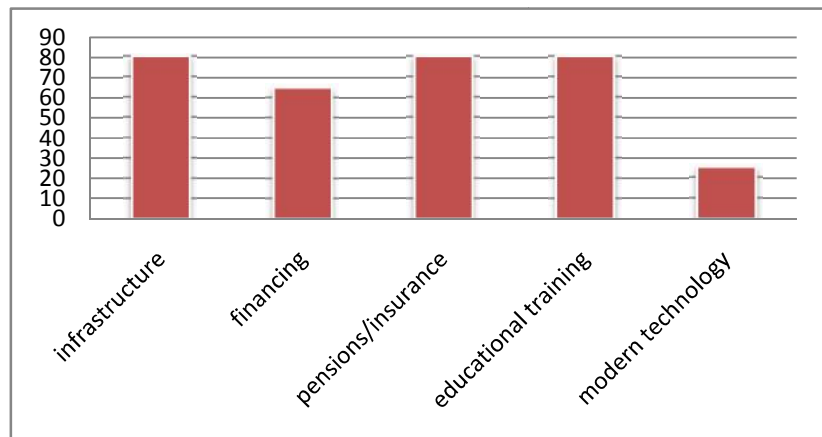


Figure 229 Suggestions for improvement

which decreases their revenue earnings. Hence a common

criteria that both the auto rickshaw drivers and unions (65%) suggested that the legal financing procedure of IPT should be made easier. And also they suggested that it would be better if government comes up with beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

### Pensions/Insurance

About 80% of auto rickshaw driver feels that insurance should be given to them as they provide services to the general public.

### Training Programmes:

About 80% of respondents in Bengaluru undergo training and educational training programmes for providing better service to customers.

### Usage of modern technology

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then only 25 % of the drivers suggested for such improvement to be

added. This response is one of the lowest as the drivers feel that the cost of the maintenance of autos will be higher with introduction of new technology and secondly if law is passed by centre for implementation of GPS in IPT then the drivers have to shelve out money from their own pockets. So the drivers do not prefer implementation of new technologies.

#### **k. Summary of findings from drivers survey**

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1. It is observed that rented IPT operating on non profitable route earns (Rs 300-500). This level is considered to be low when compared with States Minimum Wage of Rs 5410 / month. Thus the driver cannot provide a good livelihood to its family.
2. It is also seen from the survey that maintenance cost is higher for four stroke engines (average Rs 1500 per month) as the spare parts are expensive and the drivers therefore prefer to buy local parts from the markets, leading to greater number of breakdowns and faults.
3. Lack of proper infrastructure facilities like auto stands, parking areas, workshops for repairs etc.
4. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 20-25%. But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.
5. Since the educational levels are lower therefore computerized driving test are not possible to be given.

6. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.
7. Removal of political parties or mafias influences from the IPT unions as these are just an additional source for providing funds to the parties rather than providing benefits to the drivers.

## Users survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 100 users on the basis of random sampling was carried out, at various locations. By selecting various characteristics that they associate with this IPT mode

### a. Age group of users

From the survey it has been observed that all age groups of people use the IPT services. About 75% of the surveyed users belong to the age group 20 to 40 years. Only 20 % belongs to the age group between 40- 50 years. Above the age group of 50, only 5 % uses the service. Therefore the IPT services are mostly used by the working population.

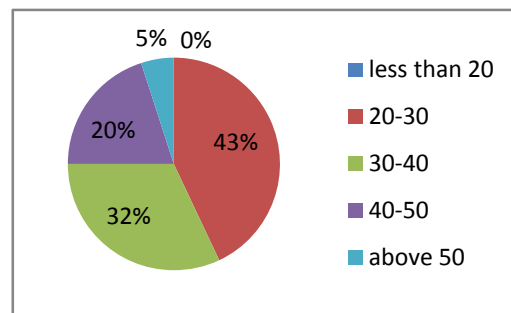


Figure 230 age profile of users

### b. Occupations of users

From the survey it is observed that more than 41% of the users belong to the private firms. About 10 % of the government uses IPT services, students account for 29% and 4% to housewives.

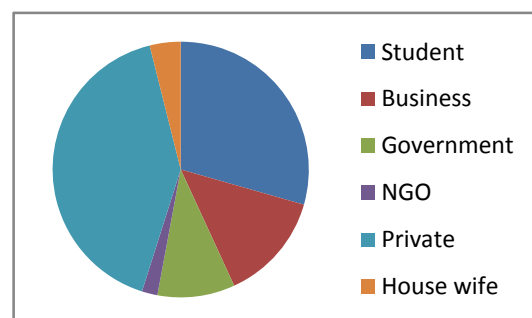


Figure 231 Occupation

### c. Purpose of trip by IPT

It has been observed that 35 % of the trip purposes for which these IPT services are used are for work purpose and 23% for social purpose. 42% uses for educational trips.

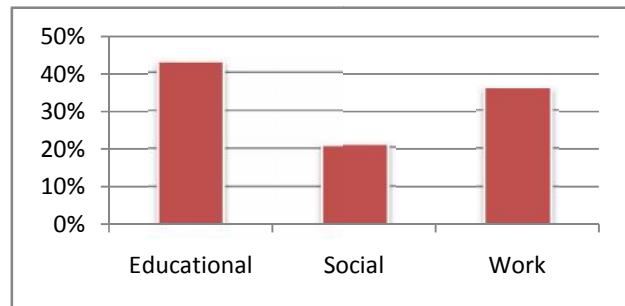


Figure 232 Trip purpose

### d. Average distance travelled by passengers

It has been observed that 90% of users travel by IPT for distances up to 10km. However only about 10% of the users travel more than distance of 10 kms and above.

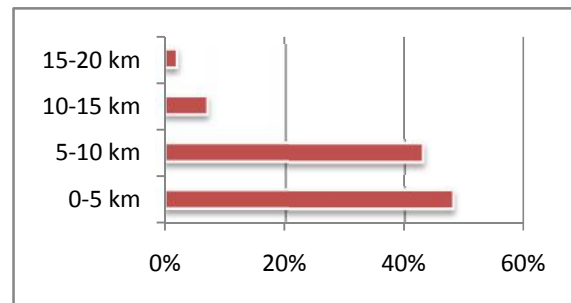


Figure 233 Average distance travelled per day

### e. Expenditure per month

From the survey it has been observed that about 98 % of users spend monthly of not more than Rs 1000 for using IPT services. However only 2 % spends more than Rs 1000, as these passengers travel more distance.

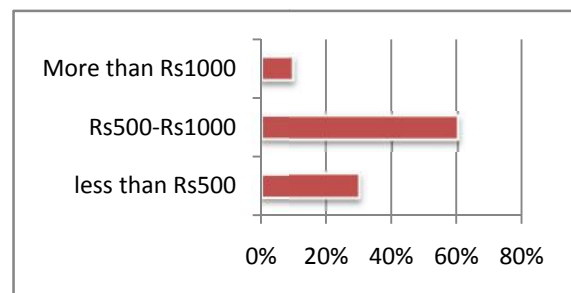


Figure 234 Expenditure per month

### f. Safety and Security

It has been stated that 70% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher. But another 30% of people are of the opinion that autos are safe modes of

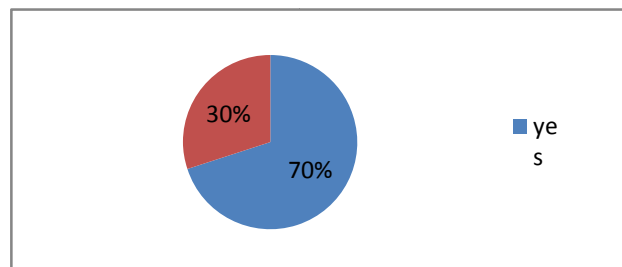


Figure 235 Safety and security mechanism in IPT vehicles

travel.

### g. Reasons for usage of IPT other than Public transport

This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

**1. Accessibility:** Nearly 60% respondents found IPT to be more accessible. The main reason being availability of auto rickshaw whenever required at all locations, though night services are not provided.

**2. Convenience:** Another characteristic associated with their preference was convenience. Around 74% respondents find IPT to be more convenient again for the main reason being its easy availability. Also the waiting time for these IPT are generally lower compared to the public transport therefore the overall journey becomes very convenient

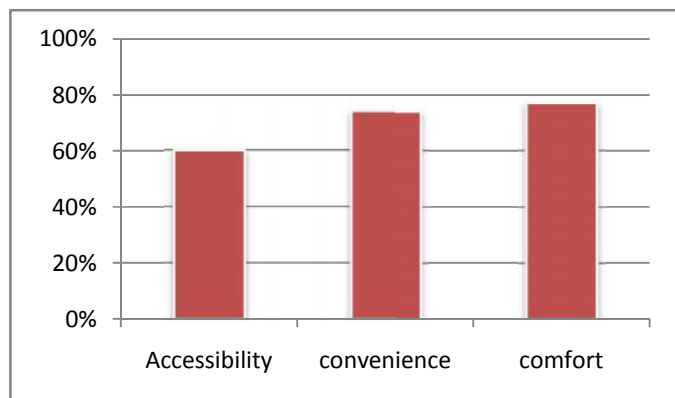


Figure 236 Reasons for usage of IPT

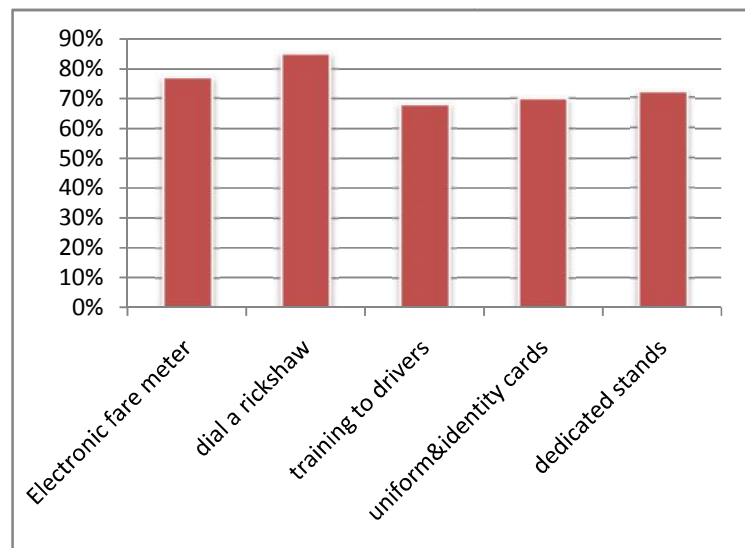
**3. Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less congestion as compared to bus and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. 77 % of the respondents using auto in Bengaluru said that it is comfortable. However few users complain of dis comfort as more passengers are illegally carried and due to long waiting time at stops in order to get passengers, the users have to wait

## **h. Other Suggestions for organizing services of IPT**

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1. Usage of modern technology- About 70% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.
2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 60% passengers are willing to use the services. The other 40% believes that there will be extra transaction charges associated with the modern technology used, as a result people would not prefer to use the services.

3. Training to drivers on road safety and driving skills were also agreed by about 68 % of the users. As the drivers often drive rashly according to passenger's perception.



**Figure 237 other suggestions**

4. 72 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion on busy roads.
5. About 70 % of users agreed that uniform dress code and identity card to all drivers make it safe for users using the service as lot of crime takes place in the city.

## **i. Summary of findings from Users survey**

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1. Charging of higher fares as the fare meters do not work leading to dispute between users and drivers. Outsiders specifically face this problem as they are unaware of the local language.

- 2.** Due to absence of dedicated auto rickshaw stands and parking areas often there is found chaos and congestion on roads.
- 3.** Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services after evening.
- 4.** A large number of users want a helpline number be made available to them so that they can register their complaints against drivers not moving on meters.

# City Analysis- Kanpur

## City Profile – Background

Kanpur is the most populous and the largest metropolitan city in the Indian state of Uttar Pradesh and is the main center for commercial and industrial activities. Formerly, known as the Manchester of the east is now also called the commercial capital of the state. According to 2011 census, the city has a population of 2,767,031.

## Transport Scenario

There are wide varieties of transport modes used in Kanpur. Cars, two wheelers, IPT, city bus service, bicycle, cycle rickshaws, etc. to cater to the needs of the commuters. With the increasing population growth and changing travel and traffic characteristics, public transportation problems are aggravating in the city of Kanpur. However, with the introduction of 300 new buses operated by Kanpur City Bus Service Ltd. under JnNURM has solved the problem of public transportation to some extent but IPT is still the main mode of public transport. Metro Rail Service is also proposed for the future.

The total number of registered IPT (both shared and private) in Kanpur is 6800 (RTO, Kanpur). The modal share for the city of Kanpur comprises of 16 % of cars, 21% of two wheelers, and 7% of IPT, 9% of Public Transport, 19% bicycle and 29% walk. (Wilber Smith Report, 2008).

## IPT System

The type of IPT functioning in the city of Kanpur is:

### Auto Rickshaw (3 seater capacity) –

This type of auto rickshaw is the commonly found auto rickshaw which operates as a contract carriage service with no fixed route and can ply anywhere within a radius of 16 Km. However, they also operate on shared basis on some routes. They serve as direct competitors to fill the demand and supply gap of Public Transport. These are meter fitted IPT but none of the drivers use the meter. The auto rickshaw has starting fare of Rs 6.86 for the first Km and increases by Rs 3.26 with every half a kilometer.



### **Vikram/Tempos (7seater capacity) –**

These types of IPT are commonly known as “Vikram” and are larger vehicles than the usual 3 seater auto rickshaw. They generally operate on a shared basis on pre decided routes within a radius of 40 Km fixed by the RTO. Operating as shuttles, they generally seat 8 – 10 passengers and operate illegally. They have a fare structure of Rs 7.48 as an initial price and increases by Rs 3.62 with every half a kilometer. However, they generally charge Rs 5 to Rs 20 from one stop to another.

### **Regulatory bodies**

The RTO and City traffic police are the main authorities looking after the regulatory issues in the city.

### **Routes and fares**

There are no pre decided routes of 3 seater IPT. However, they have been given area permits by the RTO and can ply within a radius of 16 Km. The same has been done in case of 7 seater Vikrams and can ply within a radius of 40 Km with some pre decided routes fixed by the drivers among themselves.

The fares for both 3 seater auto rickshaw and 7 seater Vikrams are fixed by the State Transport Department and the last fare revision was done in February 2014. The IPT are metered with a starting fare of Rs 6.86 for the first Km and increases by Rs 3.26 with every half a Km. The tempos have a fare structure of Rs 7.48 as starting fare and increases by Rs 3.62 with every half a kilometer. However, they generally charge Rs 5 to Rs 20 from one stop to another. Though fares are fixed from the State Transport Department and are metered but none follows these notifications.

### **Issue of permits and its renewal process**

The permit for auto rickshaw and Vikrams are issued by the RTA after the successful submission of the following documents along with a fee of Rs 1500.

- Driving License

- Insurance certificate
- Vehicle Fitness certificate
- Pollution Under control certificate(PUCC)
- Residence Proof

The time taken for processing is less than 15 days from the date of application. The permit is renewed after every 5 years at a payment of same fees of Rs 1500 that is of getting a new permit. Penalties are charged according to the days of delay in the renewal process. The number of registered IPT and tempos i.e 6800 is fixed for a period of 10 years and a new permit is issued only when old autos have to be replaced so that the number does not go beyond the prescribed limit of 6800.

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and Uttar Pradesh State Motor Vehicle Rules.

### **Infrastructure for IPT**

There is a lack of robust infrastructure for IPT vehicles in the city and unauthorized parking causing traffic congestion. However, there are some stands provided by the Nagar Nigam for these vehicles, but are not at appropriate location and do not have enough space also. But a charge of Rs 5 has to be paid by all drivers. There are no training schools and registered government workshops for repair.

### **Vehicle characteristics**

The 3 seater IPT as well as Vikrams running in the city are mostly (85%)CNG 2 stroke. However, only very few 3 seater autos are 4 stroke( 15%).

### **Sample size for auto rickshaw drivers and user survey**

Surveys were carried out for drivers and users of IPT in Kanpur city. 70 surveys for drivers and users were conducted through random sampling method at some of the busiest routes and important areas of the city. The locations surveyed were Kanpur Central Railway station, Civil Lines, Clock Tower, IIT Kanpur, Kakadeo and Kidwai Nagar.



Figure 238 Survey location

## Driver Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the city.

### a. Ownership of Vehicles

About 80% of the drivers surveyed at various locations of the city stated that they drive rented vehicles and about 20% own and drive it themselves. The main reason being that they do not have

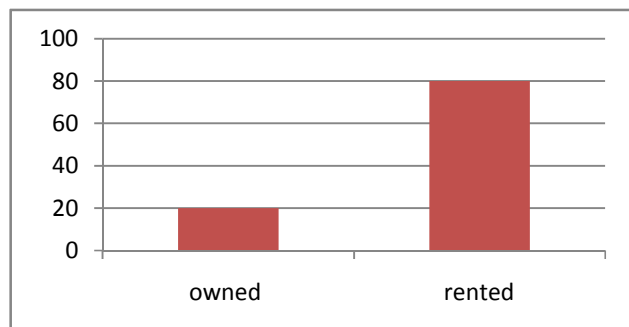
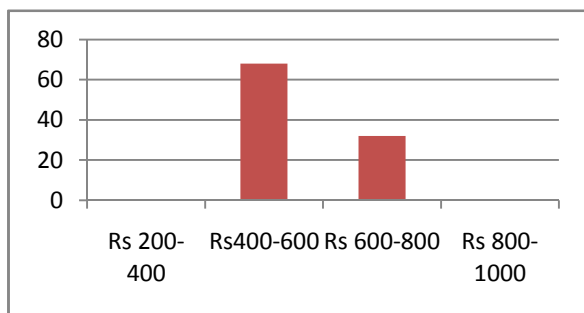


Figure 239 Ownership of vehicles

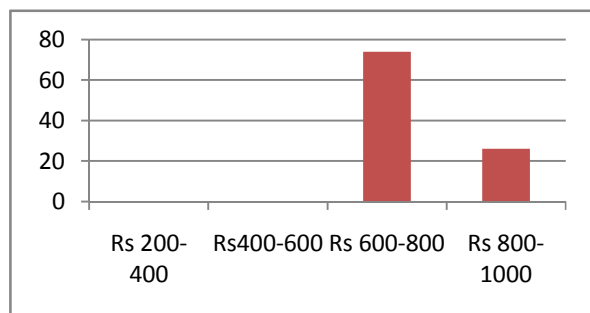
enough money to purchase an auto rickshaw and purchasing it through a loan from the bank is a lengthy and tedious process due to much of documentation required (as mentioned in previous chapters). It is also observed that majority of the owners own about 1 to 3 IPT. The rent paid by the auto rickshaw as well as Vikram drivers is Rs 250 for a 12 hour shift.

**b. Revenue earned per day**

It has been observed from the survey that the revenue earned by the auto rickshaw as well as by the Vikram drivers operating as shuttles is quite high as overloading is commonly done by them. In case of auto rickshaw, 68% of the drivers stated that the revenue earned by them in a day is between Rs400 to Rs600. The average monthly revenue is Rs 15000. About 32% stated that they earn between Rs 600 to Rs 800 in a day. In case of Vikrams operating on shared



**Figure 241 Revenue earned per day by Auto rickshaw**



**Figure 240 Revenue earned per day by Vikram**

basis, 74% of the drivers stated that they earn Rs 600 to Rs 800 per day. The average monthly income is Rs 21000 per month. About 26% also stated that the revenue earned by them in a day ranges from Rs 800 to Rs1000 earning an average of Rs 27000 per month. The 3 seater IPT also ply as shuttles on some routes carrying illegally 6 to 7 passengers and earning an average of Rs 600 per day. The main reason for variation in revenue collection is because they illegally carry more number of passengers and also because of some profitable routes such as those near Railway station and Bus Stations.

Other than fare box revenue no other permissions for revenue generation like advertisements, school permits, participation in rallies, etc. are given by the government. However, drivers

renting through schools add to their revenue collection by charging Rs 400 to Rs 500 per student per month.

**Table1. Revenue earned per month**

Descriptions		Average Earning per day(Rs)	Average earning per month(Rs)	Rent/day (Rs)	Total earning per month (Rs)
Income in case of rented IPT	<b>Private</b>	500	15,000	250	7,500
Income in case of owned IPT	<b>Private</b>	500	15,000	-	15,000
Income in case of rented IPT	<b>Shared service</b>	600	18,000	250	10,500
Income in case of owned IPT	<b>Shared service</b>	600	18,000	-	18,000
Income in case of rented auto rickshaw on profitable routes	<b>Shared service</b>	700	21,000	250	13,500
Income in case of owned IPT on profitable routes	<b>Shared service</b>	700	21,000	-	21,000
Income in case of rented Vikrams	<b>Shared service</b>	700	21,000	250	13,500
Income in case of owned Vikrams	<b>Shared service</b>	700	21,000	-	21,000
Income in case of rented Vikrams on profitable routes	<b>Shared service</b>	900	27,000	250	19,500
Income in case of owned Vikrams on profitable routes	<b>Shared service</b>	900	27,000	-	27,000
Income in case of rented Auto rickshaw + School permit	<b>Private</b>	500 + 80*	15,000+ 2400 = 17,400	250	9,900

Income in case of owned Auto rickshaw + school permit	Private	500 + 80*	15,000+2400= 17,400	-	17,400
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\*Renting through schools with a monthly fee of approximately Rs 400/ student with a maximum of 6 students in an auto rickshaw. However, there is no provision of school permit by the government.

**c. Average length travelled by auto per day**

About 58% of the drivers stated that the average length travelled by an auto per day ranges from 50 to 100 km while 28% stated that it is between 100 to 150 km per day. About 14% stated that the average length travelled to be between 150 to 200 km per day. About 14% stated that the average length travelled to be between 200 km and above 200 km per day.

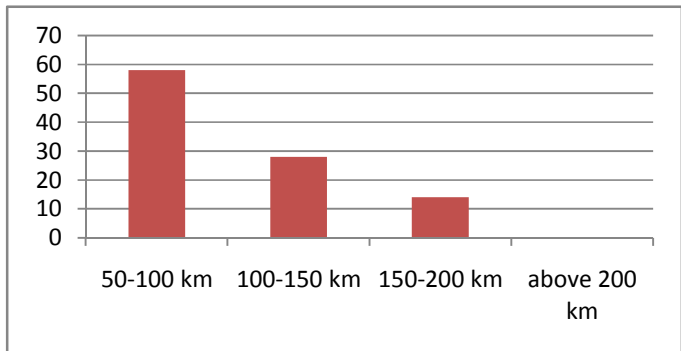


Figure 242: Average length travelled by auto/day

**d. Passengers travelled per day per auto**

It has been observed in Kanpur that passengers travelled per day per auto are significantly high because IPT vehicles are used as the main mode of public transport. About 72% of the drivers stated that they carry more than 50 passengers per day while 20% carry between 80 to 120 passengers. About 8% also stated that the passengers travelled per day in their autos are more than 120. This variation is due to the overloading of vehicles which is illegal.

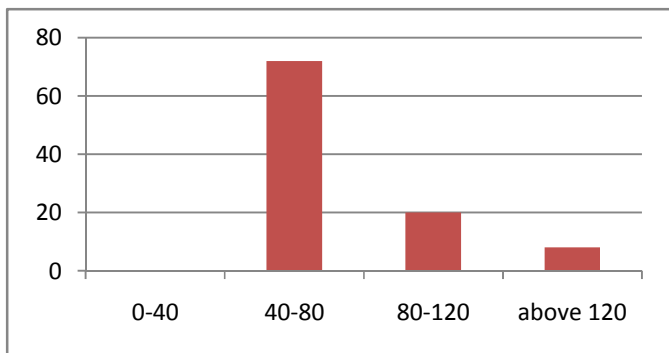


Figure 243 Passengers travelled per day per auto

#### e. Funding provisions to operators

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents (refer to previous chapter) required by the banks to finance the loan. Hence the

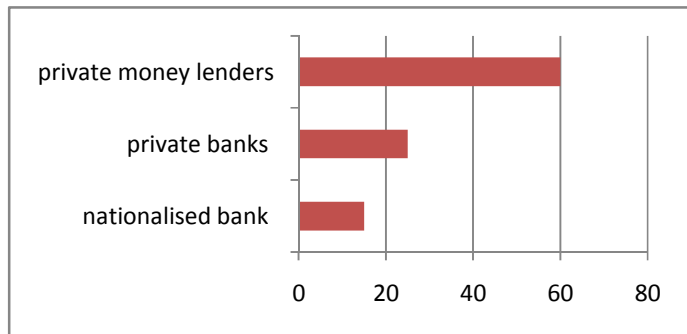


Figure 244 Financing IPT

driver feels it easy to resort to a private financier even though the financier charges higher interest of 18 -20% as compared to nationalised banks which charge from 10.5- 12.5. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without much paper work. Though, a lot of money is taken as source of commission to the dalals for helping drivers to buy new vehicles. Thus the graph shows that due to the above mentioned reasons nearly 60 % of the auto rickshaw drivers prefer financing through private money lenders rather than approaching banks. About 25 % get loans from private banks and only 15% from nationalised banks.

#### f. Maintenance of vehicles

About 52% of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs1000-2000. The average maintenance cost per month is Rs 1500. 32% stated that the cost of maintenance of the vehicles per month is from Rs 2000-Rs 3000 (average Rs 2500/month) while 16% also stated that the maintenance cost is above Rs 3000. The reason for the variation in maintenance cost is due to the old 2 stroke engines being used in Vikrams 3

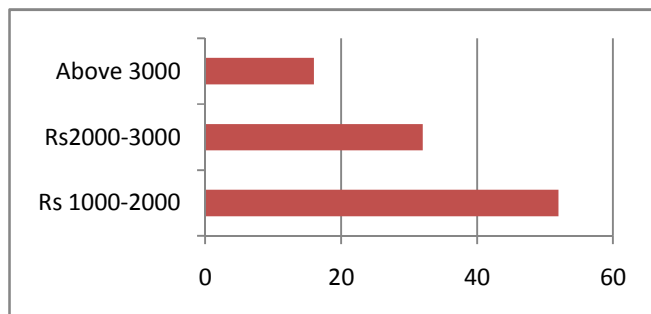


Figure 245 Average maintenance cost/ month

seater IPT whereas 4 stroke engines also have a higher maintenance cost but are smoother in operation with less breakdowns.

**g. Other charges/penalties**

Fine and penalties are charged on auto drivers by the traffic police and RTO's mainly for rule violations, overloading of passengers, incomplete documents, etc.

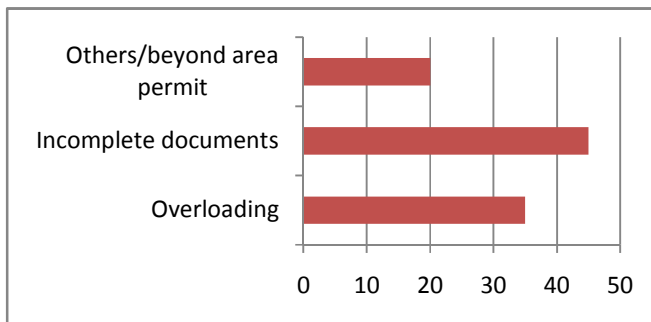


Figure 246 Reasons for penalties/fines

About 35% of the autos are fined for overloading.45% is fined for incomplete

documents and 20% for other reasons such as going beyond their area permits, etc. However, the traffic penalties are often converted into sources of bribe for the city traffic officials. It has been found from the survey that the drivers have to pay certain amounts per month or per day to Nagar Nigam, traffic police, unions, etc to keep their operations running. The total income and expenditure are given below:

**Table 2. Total income and expenditure of auto drivers**

Descriptions		Total earning per month(in Rs)	Maintenance cost/ month(In Rs)*	Payment to police or other authorities /month (Rs) **	Total expenditure /month (in Rs)	Total revenue/ month (in Rs)
Income in case of rented IPT	<b>Private service</b>	7,500	1500	230	1730	5,770
Income in case of owned IPT	<b>Private</b>	15,000	1500	230	1730	13,270
Income in case of rented auto rickshaw	<b>Shared service</b>	10,500	1500	230	1730	8,770



Income in case of owned auto rickshaw	<b>Shared service</b>	18,000	1500	230	1730	16,270
Income in case of rented auto rickshaw on profitable routes	<b>Shared service</b>	13,500	1500	230	1730	11,770
Income in case of rented Vikram	<b>Shared service</b>	13,500	1750	390	2140	11,360
Income in case of owned Vikram	<b>Shared service</b>	21,000	1750	390	2140	18,860
Income in case of rented Vikram on profitable routes	<b>Shared service</b>	19,500	1750	390	2140	17,360
Income in case of owned Vikram on profitable routes	<b>Shared service</b>	27,000	1750	390	2140	24,860
Income in case of rented Auto rickshaw + School permit	<b>Private</b>	9,900	1500	230	1730	8,170
Income in case of owned Auto rickshaw + school permit	<b>Private</b>	17,400	1500	230	1730	15,670

\*approximate maintenance cost per month taken

\*\*These are the approximate miscellaneous costs incurred upon the drivers as they have to make some payments weekly or daily to certain authorities to keep their operations running.

#### **h. Association with unions**

There are various unions at every stand formed by the drivers among themselves but none is registered and working actively. They just decide among themselves about the routes to be

followed by the IPT but no other benefits are being provided to the drivers. When drivers were asked about their association with the unions, most of them replied with a common answer that there is no benefit such as health camps, training, etc. being provided by these unions.

**i. Other problems**

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1. As per the driver's survey more than 70 % of the drivers have obtained only primary education up to 5<sup>th</sup> standard, about 25 % of the drivers in Kanpur are graduate while 5% of them are illiterate. Therefore the computerized driving test becomes a problem for drivers.
  2. No social benefits given like training, medical facilities, etc.
  3. No registered auto unions for providing benefits.
  4. Lack of designated parking areas and stands for the vehicles at night.
  5. Prevalence of Dalals and private money lenders which often leads to harassment of drivers.
  6. Payments to various authorities such as Nagar Nigam and traffic police which has a significant effect on their revenues.
- j. Other suggestions like financing assistance, provision of infrastructures, social benefit schemes

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In the driver survey, various suggestions were given in order to make their operations and socio-economic conditions better.

**Infrastructure**

The drivers were asked to give their opinions on what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals) would improve their operations. More than 60% respondents in Kanpur suggested for provision of parking areas for the vehicles. Though, the stands have been provided by the Nagar Nigam but no facilities as such is given to the drivers of vehicles due to lack of enforcement.

## Financing

As mentioned earlier owning a new auto rickshaw is not an easy option for drivers as financing procedures are quite lengthy and tedious. The drivers have to shelve out money for providing charges to unions, dalals, rent to owners, etc. which decreases their earnings. There is presence of dalals, private money lenders

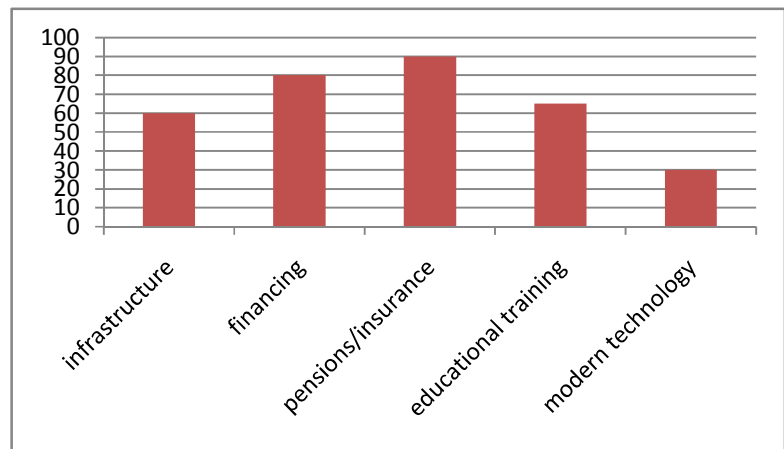


Figure 247 other suggestions

and other mediators who often charge high rate of interests leading to harassment of the drivers. Hence, most of the respondents about 80% suggested that financing procedures should be made easier and private money lenders should be removed from the system.

## Pensions/Insurance

About 90% of auto rickshaw drivers in Kanpur feel that insurance and other government benefits should be given for their future security, as the drivers are providing services to the general public.

## Training Programmes:

About 65% of respondents in Kanpur agreed to undergo road safety training and educational training programmes for providing better service to customers.

## Usage of modern technology

When drivers were made aware of the modern technology such as tracking vehicles through GPS and services like dial a rickshaw, then only 30% of the drivers suggested for such improvements to be added. The reason for less percentage is due to the fact that the drivers do not want to take an extra burden on them for installation of modern technology.

### k. Summary of findings from the drivers survey

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1. From the survey it was found that the drivers of rented IPT earning an average of Rs 500 per day are the worst sufferers as these drivers cannot provide better future to their families because the earning is below the mentioned minimum wages as fixed by the Labour Welfare Department of Uttar Pradesh (Rs 9000 per month).(Refer table 1& 2)
2. Lack of enforcement by Traffic police as the auto rickshaw stands are always encroached and therefore the autos stand on the road causing congestion.
3. Lack of proper infrastructure facilities like parking areas, workshops for repairs etc.
4. From the survey, it has also been found that the drivers have to make payments on a weekly basis to authorities like Nagar Nigam and traffic police as parking charges and other charges to continue their operations.
5. From the drivers survey it has been observed that financing for IPT is a major issue and the involvement of Dalals and private money lenders is causing exploitation of the drivers charging high rate of interests.
6. There are no registered auto unions working for the benefits of the drivers.

### **User Survey**

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 70 users on the basis of random sampling was carried out, at various locations of city, rural and other routes by selecting various characteristics that they associate with this IPT mode.

### a. Age group of users

From the survey it has been observed that all age groups of people in Kanpur use the IPT services as it is one of the main modes of public transport. Although, there is a bus system operated by Kanpur City Bus Service Ltd. but IPT is usually preferred within the city. About 50 % of the surveyed users belong to the age group 30 to 50 years. 40 % belongs to the age group up to 30 years. Above the age group of 50, only 10% use the service. Therefore, we conclude that the IPT services are mostly used by the working population as well as by the college going students.

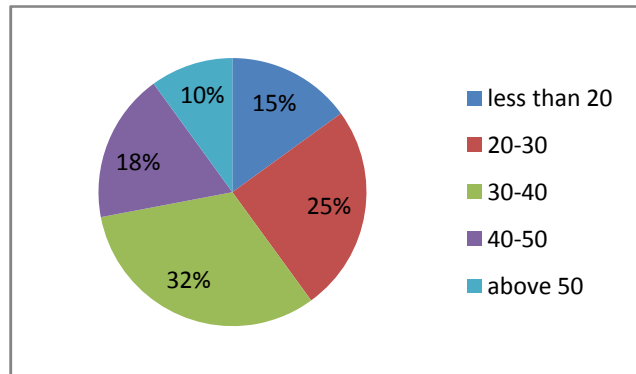


Figure 248 Age profile of users

### b. Occupation of users

From the survey it is observed that more than 30 % of the users belong to the private firms as Kanpur is the main industrial hub of Uttar Pradesh. About 18 % of the users are government employees, students account for 22% and 15% housewives. However around 15 % of users have their own business in the city.

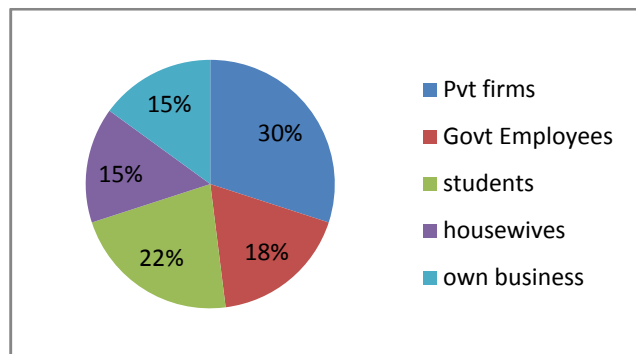


Figure 249 Occupation of users

### c. Purpose of trip by IPT

It has been observed that more than 50 % of the trips are for work purpose and only 20% for social purpose as people in Kanpur prefer to use their own vehicles over public transport when going out for shopping and

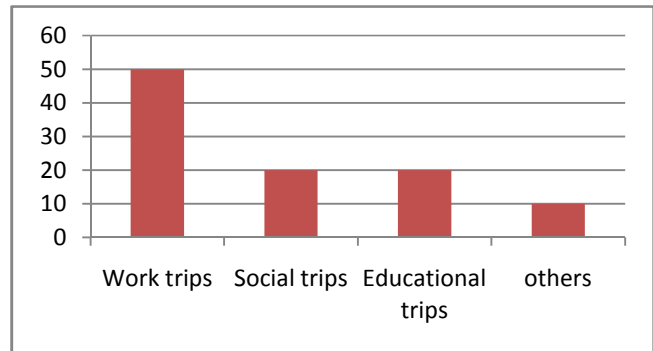


Figure 250 Trip purpose

other social purposes. About 20% uses for educational trips and 10% for some other purposes such as health care and religious purpose.

### d. Average distance travelled by passengers

It has been observed that majority of the users about 65% travel a distance of 2 to 10 km by the IPT services. However, there are many users about 25% who travel a

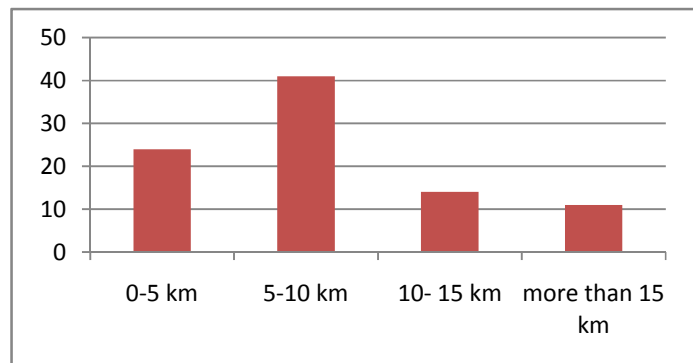


Figure 251 Distance travelled by users

distance of more than 10 km as people from the nearby places such as dehat come to the city for earning their livelihoods and these long trips are usually catered by Vikrams.

### e. Expenditure per month

It has been observed that most of the users, around 70% spend between Rs500-Rs1000/month on the IPT services. These are usually working professionals and students who daily use the service for their work and

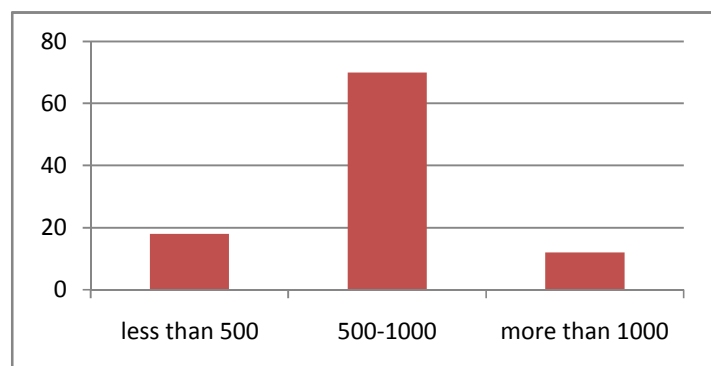
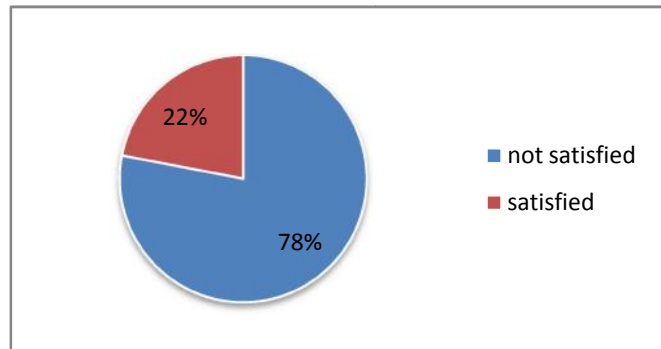


Figure 252 Expenditure per month

educational purpose. About 18% spend upto Rs 500 as these are not the regular users and only 12% spend more than Rs1000.

**f. Safety and Security**

It has been observed that 78% of the users are not satisfied with the safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher especially for females and elderly.



**Figure 253 safety and security mechanism in IPT vehicles**

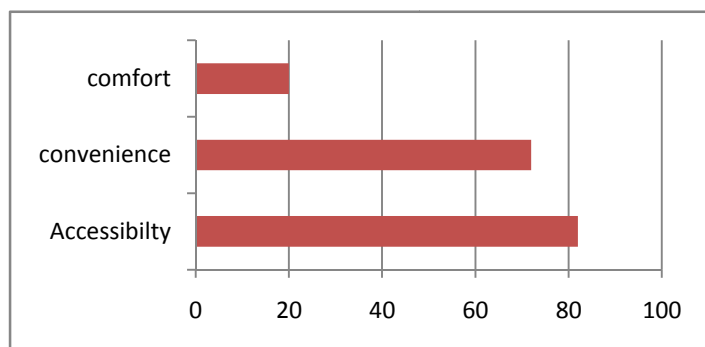
Overloading, over speeding and rash driving are the major concerns which leads to the dissatisfaction of the users.

**g. Reason for usage of IPT other than Public Transport**

This criterion was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

**1. Accessibility:** Accessibility of IPT was found to have been the most likely reason for preference over public transport. Around 82% of the respondents stated this reason as auto rickshaw as well as Vikrams can be found easily at every corner of the street. Bus system is not so successful in Kanpur mainly because of traffic congestion due to narrow roads causing delay in service.

**2. Convenience:** Another characteristic associated with their preference was convenience. Around 70% respondents find IPT to be more convenient again for the



**Figure 254 Reasons for usage of IPT**

main reason being its easy availability. Also the waiting time for auto rickshaw is less and provides last mile connectivity. For shared rickshaws, the convenience was lower as more people are carried at one time and also due to long waiting time.

- 3. Comfortable:** Comfort was one of the criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. About 80% of the users in Kanpur said that comfort levels were considered to be very poor as there is always overloading of passengers in both cases.

#### h. Other suggestions for organizing the services of IPT

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1. Usage of modern technology- Majority of the users about 60% suggested the usage of modern technology like providing GPS metered electronic fare system so that drivers do not charge illegally.
2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 70 % passengers are willing to use the services. The other 30% believes that there will be extra transaction charges associated with the modern technology used, as a result people would not prefer to use the services.

3. Training to drivers on road safety and driving skills were also agreed by about 85 % of the users. As the drivers often drive rashly according to passenger's perception.

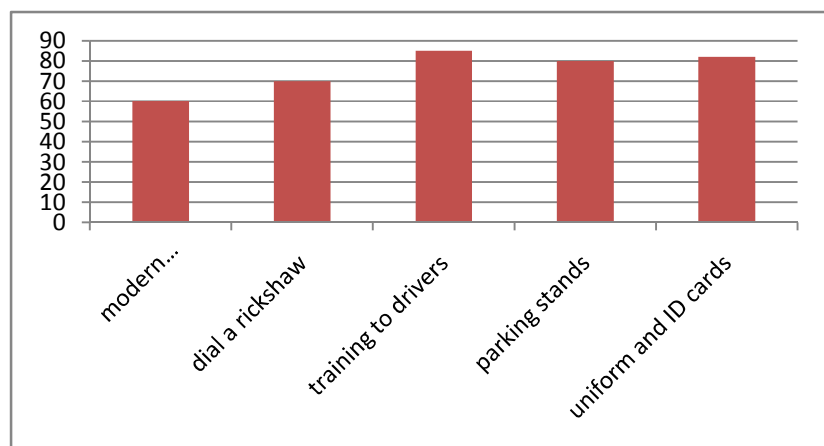


Figure 255 Other suggestions

4. 80% of the users agreed that there should be dedicated parking areas and stands to avoid traffic congestion on roads.



5. Majority of the users in Kanpur also agreed that uniform dress code and identity cards to all drivers to make it safe for users as they do not feel safe especially ladies during the night.

**i. Summary of the findings from the user survey**

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1. Carriage of more passengers both in case of 3 seater auto rickshaw as well as Vikram compared to the design capacity of the rickshaws, leading to dis comfort.
2. Though meters are installed in 3 seater IPT but they do not work and there is often quarrel between drivers and users. Though there are government notifications for fare structure.
3. Safety and security mechanisms are missing therefore the users especially females and elderly do not feel safe to use the services after evening.
4. Most of the users complained of the overloading, over speeding and rash driving by the auto rickshaw and Vikram drivers which creates safety concerns in the users.

# City Analysis- Mumbai

## City Profile – Background

Mumbai is the capital city of the Indian state of Maharashtra. It is the fifth most populous city in the world. According to 2011 census, the Mumbai metropolis has a population of 12,478,447. Along with the urban areas, including the cities of Navi Mumbai, Thane, Bhiwandi, Kalyan, it is one of the most populous urban regions in the world. Mumbai lies on the west coast of India and has a deep natural harbour. Its location is prime owing to proximity to the coast, and is considered to be the financial capital of India and home to the Bollywood film industry. It is also the wealthiest city in India, and has the highest GDP of any city in South, West or Central Asia

## Transport Scenario

There is no scarcity of transportation options in Mumbai. A thick network of roads encompasses the city as well as three train lines, buses, taxis and auto-rickshaws. Public transport systems in Mumbai include the Mumbai Suburban Railway, Monorail, Metro, Brihanmumbai Electric Supply and Transport (BEST) buses, black-and-yellow meter taxis, IPT and ferries. Auto-rickshaws, by law, are restricted to Suburban Mumbai, with Bandra and Sion being the southernmost areas where auto-rickshaws can ply.

The total number of registered IPT in Suburban Mumbai is approximately 1, 20,000 (source: Motor Transport Statistics of Maharashtra march 2011). There are approximately 41,752 IPT in East Mumbai along with 8,851 new permits going to be issued in 2014. (RTO, Mumbai East, 2014). The modal share for the city of Mumbai comprises of 27 % by walk, 15% private transport including two wheelers and cars, 6% bicycle, 7% IPT and 45% of Public Transport including Buses and Trains. (Wilbur Smith Report, 2008).

## IPT System

The only type of auto rickshaw functioning in Mumbai is:

### **Auto Rickshaw (3 seater capacity) –**

This type of auto rickshaw is the commonly found auto rickshaw which operates as a contract carriage service with routes fixed by Mumbai Metropolitan Region Transport Authority(MMRTA). These are electronic meter fitted IPT which are generally used by the passengers as a quick mode of connectivity from one place to another in the absence of private vehicles and as a feeder to the main mode of Public Transport. These IPT do not run on shared basis and can only be hired individually. The IPT charge Rs 15 for the first km (i.e the minimum fare) and additional charge of Rs 9.87 for every other kilometer.

### **Regulatory bodies**

The Mumbai Metropolitan Region Transport Authority(MMRTA) and City traffic police are the main authorities looking after the regulatory issues in the city.

### **Routes and fares**

The routes for these IPT are fixed by the Mumbai Metropolitan Region Transport Authority (MMRTA) and can ply only in the suburban regions and not in the island or south Mumbai city.

There is a well-defined fare structure for Auto rickshaw with electronic meter for the Mumbai metropolitan region. These fare structures are decided by the MMRTA. A survey is conducted every year in May according to the Hakim Committee Report and accordingly fare revision is done. The last fare revision was done in June, 2013. The IPT have a fare structure of Rs 15 for the first km (i.e the minimum fare) and additional charge of Rs 9.87 for every other kilometer.

### **Issue of permits and its renewal process**

The permit for auto rickshaw is issued by the RTO after the successful submission of the following documents along with a fee of Rs 200.

- Residence Proof
- Insurance certificate
- Vehicle Fitness certificate
- Pollution Under control certificate(PUCC)
- Driving License

- Filled PCOP form/ other forms

The time taken for processing is less than 15 days from the date of application. The permit is renewed after every 5 years at a payment of Rs 200 every time. Penalties are charged according to the days of delay in the renewal process. If it is not renewed within 6 months, then a penalty of Rs 100 is charged.

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and Maharashtra Motor vehicle Act, 1998.

### **Infrastructure for IPT**

Keeping in view the importance of IPT as feeder services to the main mode of public transport, there were designated stands provided by the RTO but recently many of the stands and parking areas have been removed leading to serious parking problems in the city. There is no provision for rest rooms for drivers and registered government repair workshops, etc.

### **Vehicle characteristics**

Earlier, the IPT in Mumbai used to have 2 stroke petrol engines but 4 to 5 years ago all the petrol engines have been replaced by CNG kits. Now, the IPT in Mumbai are 100% CNG run with 4 stroke engines. Very few are 2 stroke engines and are being converted into 4 stroke engines.

### **Sample size for auto rickshaw drivers and user survey**

Surveys were carried out for drivers and users of IPT in suburban Mumbai. 100 surveys for drivers and users were conducted through random sampling method at some of the busiest routes and important areas in the city. The locations surveyed were Hiranandani Business Park, Powai, S V Road, Borivalli(E), Hill Road, Bandra(W), Juhu Chowpatty, Andheri(E) Railway station and Santacruz(E) Railway Station.

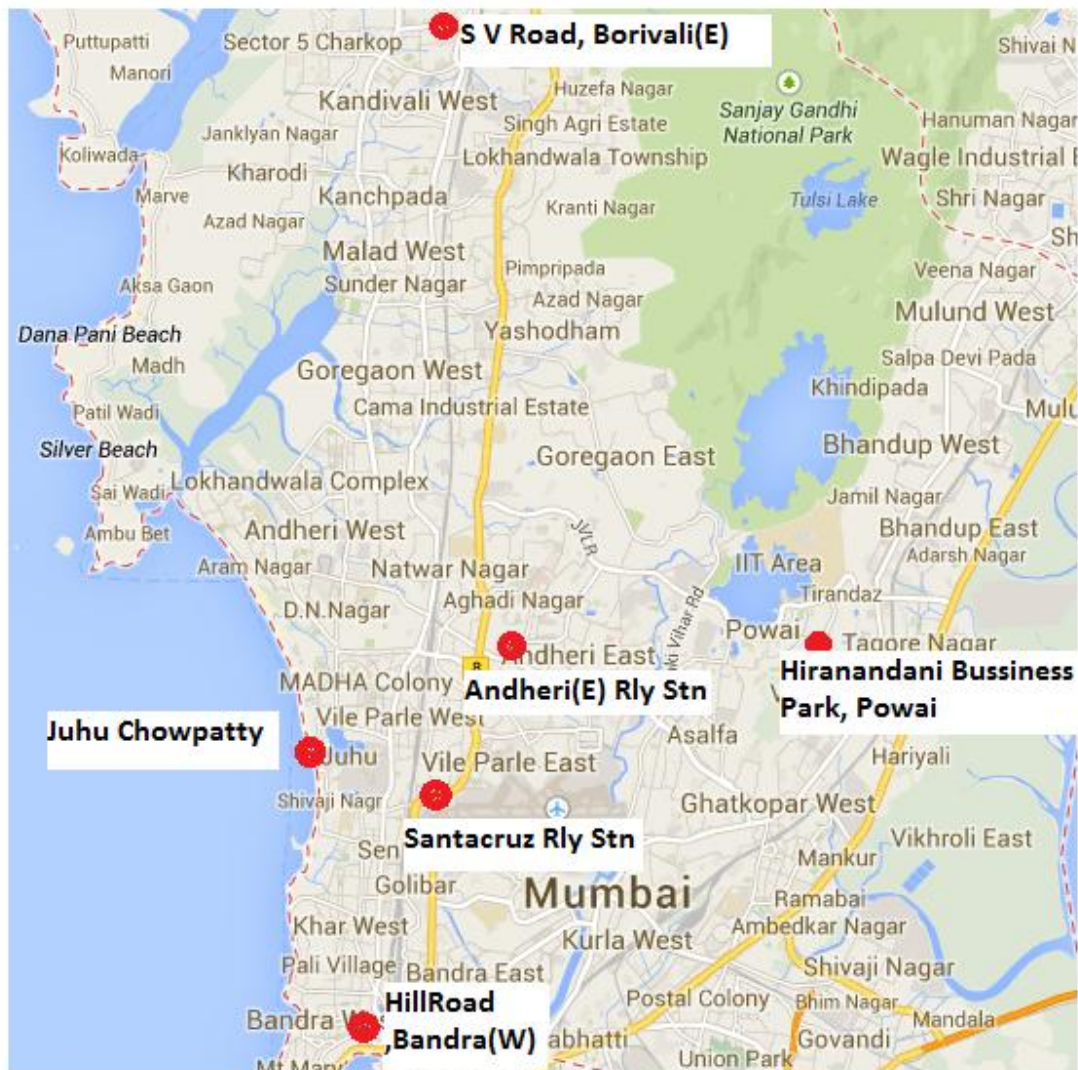


Figure 256 Survey location

## Driver Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the city.

### a. Ownership of Vehicles

About 78% of the drivers surveyed at various locations of the city stated that they drive rented vehicles and about 22% own and drive it themselves. The main reason being that they do not have enough money to purchase an auto rickshaw and purchasing it through a loan from the

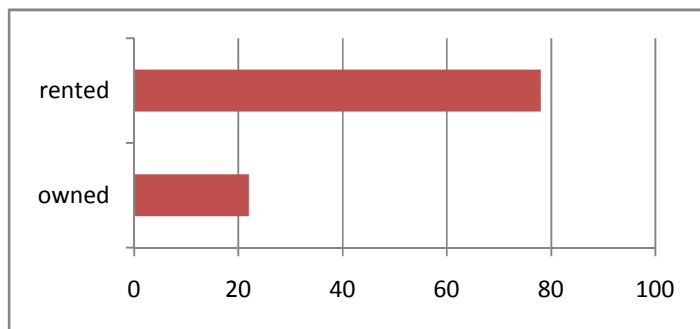


Figure 257 Ownership of vehicles

bank is a lengthy process due to much of documentation required (as mentioned in previous chapters). It is also observed that majority of the owners own about 1 to 5 IPT. The rent paid by the drivers is Rs 230 per day for a 12 hour shift.

### b. Revenue earned per day

A large percentage of drivers, about 67%, stated that their average revenue per day lies between Rs 400 to Rs 600 (Average Rs 15000/month). About 25% stated their daily revenue is between Rs 600 to Rs 800 (Average Rs 21000/ month) while only 8% earn more than Rs 800/ day. The

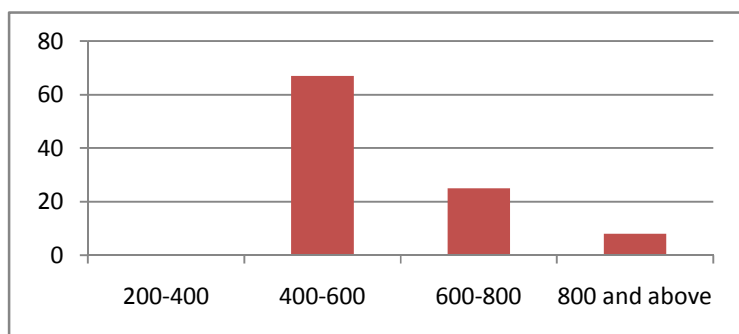


Figure 258 Revenue Earned /day by auto

difference lies due to the fact that there are some busy routes with more number of passengers such as near railway stations as compared to other routes.

Other than fare box revenue, revenue through advertisements is also one of the sources of revenue generation for some of the drivers. But it is quite nominal and they usually earn Rs 200 to Rs 300/month by placing advertisements on their IPT. Advertisement permit is issued by the Mumbai Metropolitan Region Transport Authority (MMRTA) by the lottery system at a payment of some annual fee to the RTO.

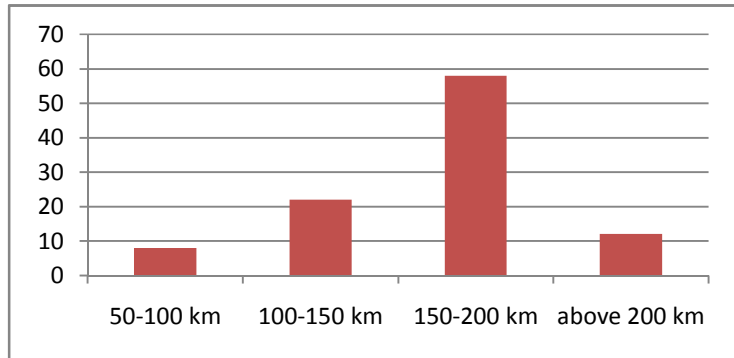
**Table 1. Revenue earned per month**

Descriptions		Average Earning per day(Rs)	Average earning per month(Rs)	Rent/day(Rs)	Total earning per month(Rs)
Income in case of rented IPT	<b>Private service</b>	500	15,000	230	8,100
Income in case of owned IPT	<b>Private service</b>	500	15,000	-	15,000
Income in case of rented IPT on profitable routes(near railway station and airport)	<b>Private service</b>	700	21,000	230	14,100
Income in case of owned IPT on profitable routes(near railway station and airport)	<b>Private service</b>	700	21,000	-	21,000
Income in case of owned IPT + Advertisement revenue	<b>Private service</b>	500	15,000+300*	-	15,300
Income in case of rented IPT + Advertisement revenue	<b>Private service</b>	500	15,000+300*	230	8,400
Income in case of owned IPT on profitable routes + Advertisement revenue	<b>Private service</b>	700	21,000+300*	-	21,300
Income in case of rented IPT on profitable routes + Advertisement revenue	<b>Private service</b>	700	21,000+300*	230	14,400

\*Advertisement permit is issued by the MMRTA by the lottery system at a payment of some annual fee to the RTO. The advertisement revenue collected is approximately Rs 300/ month.

**c. Average length of the trip**

As suburban Mumbai is a big and diversified area, about 58 % of the drivers stated that the average length travelled by auto per day is between 150-200km, about 22% stated that their trips are between 100 to 150 km and 12 % stated

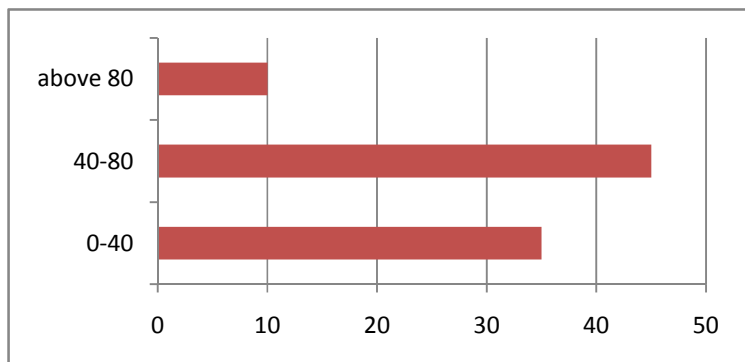


**Figure 259 Average length of the trip**

that the average length travelled is above 200 km while only 8% have their average trip between 50 to 100 km. These long distance travel trips cater to the routes which connect two suburban areas such as Andheri to Bandra or Andheri to Borivali, etc.

**d. Passengers travelled per day per auto**

From the survey, it is found that about 35% of the drivers carry up to 40 passengers per day while about the same percentage of them (about 45%) stated that they carry between 40 and 80 passengers per day and only 10% of them carry more than 80 passengers. This



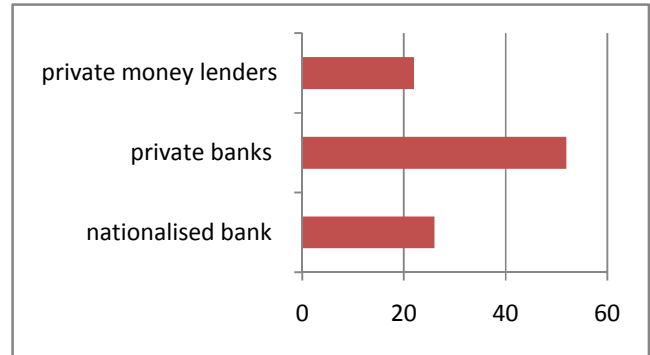
**Figure 260 Passengers travelled per day per auto**

difference as stated earlier is because of some busy routes near to railway stations and airport.



**e. Funding provisions to operators**

From the drivers survey, it has been observed that most of the drivers prefer to take loans from the private banks as it is convenient and requires much less paper work as compared to nationalised banks where the process is quite tedious. Also, many times the driver does not possess all the necessary documents

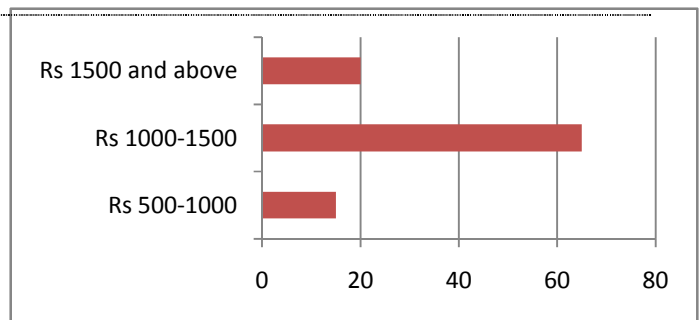


**Figure 261 Financing IPT**

(refer to previous chapter) required by the banks to finance the loan. Hence, the driver feels it easy to resort to a private financier even though the financier charges higher rate of interest of 20 -25% as compared to nationalised banks which charge from 10.5- 12.5%. Thus, due to the above mentioned reasons, 22% of the drivers prefer to take loans from private money lenders, 52% from private banks and about 26% from nationalised banks.

**f. Maintenance cost of Vehicles**

In Mumbai, there are mostly 4 stroke CNG three wheeler IPT. About 65% of the drivers stated that the maintenance cost of the vehicle comes out to be between Rs 1000 to Rs 1500. The average maintenance cost per month is Rs 1250.

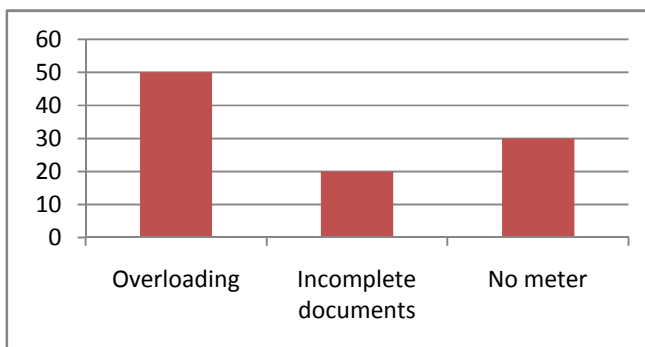


**Figure 262 Average maintenance cost/ month**

About 20% stated that the cost of maintenance per month is between Rs 1500-Rs 2000 while 15% of the drivers have their maintenance cost per month under Rs 1000. The reason for the difference in the maintenance cost is due to the fact that there are still some old 2 stroke vehicles left to be converted into 4 stroke engines. It was also found that the drivers do not have much attachment with the vehicle as they are rented and therefore do not care for the maintenance.

**g. Other charges/penalties**

Fine and penalties are charged on auto rickshaw drivers by the traffic police and RTO mainly for overloading of passengers, incomplete documents, unauthorized parking, no uniform and operating without



meters, etc. About 50% of the autos are fined for overloading. 20% are fined for

**Figure 263 .Reason for fines/penalties**

incomplete documents and 30% for other reasons such as no proper uniform and operating without meters. The total income and expenditure are given below:

**Table2. Total income and expenditure of auto drivers**

Descriptions		Total earning per month(in Rs)	Maintenance cost/month(In Rs)	Payment to police /month (Rs)	Total expenditure /month (in Rs)	Total revenue/month (in Rs)
Income in case of rented IPT	<b>Private service</b>	8,100	1250		1,250	6,850
Income in case of owned IPT	<b>Private service</b>	15,000	1250		1,250	13,750
Income in case of rented IPT on profitable routes(near railway station and airport)	<b>Private service</b>	14,100	1250		1250	12,850
Income in case of owned IPT on profitable routes(near railway station and airport)	<b>Private service</b>	21,000	1250		1250	19,750
Income in case of owned IPT +	<b>Private service</b>	15,300	1250		1250	14,050

Advertisement revenue						
Income in case of rented IPT + Advertisement revenue	<b>Private service</b>	8,400	1250		1250	7,150
Income in case of owned IPT on profitable routes + Advertisement revenue	<b>Private service</b>	21,300	1250		1250	20,050
Income in case of rented IPT on profitable routes + Advertisement revenue	<b>Private service</b>	14,400	1250		1250	13,150

\*average of maintenance cost per month taken

#### **h. Association with unions**

There are 4 auto unions registered under the Trade Union Act, working for the private auto rickshaw drivers. The unions provide benefits in official matters like renewal of permits, getting loans sanctioned for new vehicles and act as mediators in case of disputes. The unions also provide legal support to its members. However, in real terms, more political influence is seen on these unions and as such drivers do not get the required benefits.

#### **i. Other problems**

1. As per the driver's survey most of the drivers (about 75%) have obtained only primary education up to 5<sup>th</sup> and 8<sup>th</sup> standard and only 2% are graduate and above 2% are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. Lack of designated parking areas and stands is one of the major issues reflected in the drivers' survey.

3. Unauthorized selling of auto rickshaw permits has also been reflected in the survey due to which the fleet size increases automatically leading to increased competition.
4. Less number of CNG refilling stations which leads to long queues.
5. More political influence on auto unions due to which the drivers are deprived of the social benefits like medical facilities, insurance, etc.
- 6.

**j. Other suggestions like financing assistance, provision of infrastructures, social benefit schemes**

---

In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

**Infrastructure**

The drivers were asked to give their opinions on what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, etc.) would improve their operations. About 75% respondents in Mumbai suggested for provision of parking areas and stands. However, there were stands and parking areas but due to some reason they have been removed by the government and IPT can be seen parked on the roads causing congestion.

**Financing**

As mentioned earlier owning a new auto rickshaw is not an easy option for drivers as financing procedures are quite lengthy and tedious. The drivers have to shelve out money for providing charges to unions, rent to owners, etc. which decreases their earnings. Hence, both the auto rickshaw drivers and unions (80%) suggested that the financing procedure of IPT should be made easier and loans should be provided at a lower rate from the banks.

### Pensions/Insurance

About 84% of auto rickshaw driver feels that insurance should be given for their future security, as the drivers are providing services to general public and helping in a social cause.

They also suggested that there should be laws supporting the drivers in case of passengers misbehaving with them.

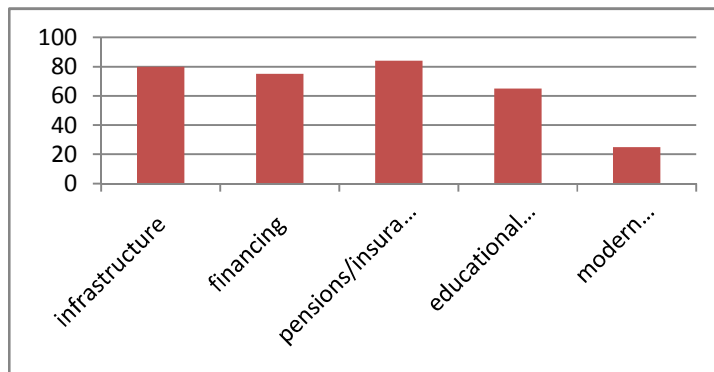


Figure 264 Suggestions for improvement

### Training Programmes:

About 60% of respondents in Jodhpur agreed to undergo road safety and educational training programmes for providing better service to customers.

### Usage of modern technology

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then only 25 % of the drivers suggested for such improvement to be added. The reason for less percentage is due to the fact that drivers have to bear the extra cost burden of installing new technology. They agreed to use the technology if provided by government.

### k. Summary of findings from the drivers survey

1. From the survey it is found that the drivers of rented IPT earning an average of Rs 500 per day are the worst sufferers as their earnings are below the minimum wage level of the state for public motor transport i.e Rs 7980 per month.
2. Lack of designated parking areas and stands is one of the major issues reflected in the drivers' survey.
3. Unauthorized selling of permits due to which the fleet size increases.

4. Lack of CNG refilling stations which leads to long queues.
5. Lack of proper infrastructure facilities like parking areas, workshops for repairs etc.
6. No social benefits such as health checkups, insurance, etc.

## User Survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 60 users on the basis of random sampling was carried out, at various locations. of city, rural and other routes by selecting various characteristics that they associate with this IPT mode.

### a. Age group of users

From the survey it has been observed that all age groups of people use the IPT services. About 62 % of the surveyed users belong to the age group 30 to 50 years. 26 % belongs to the age group up to 30 years. Above the age group of 50, only 12% uses the service. Therefore, we conclude that the IPT services are mostly used by the working population.

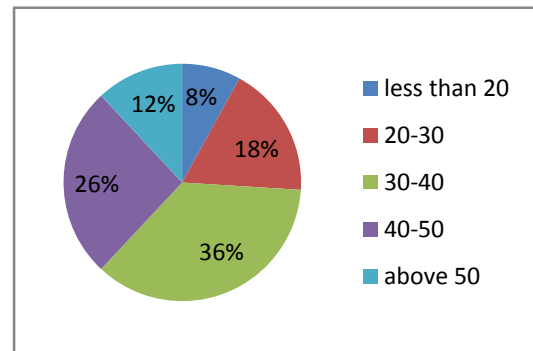


Figure 265 age profile of users

### b. Occupation of users

From the survey it is observed that more than 45 % of the users belong to the private firms. About 22 % of the users are government employees, students account for 12% and 10% housewives. However, around 11 % of people are having their own business in the city.

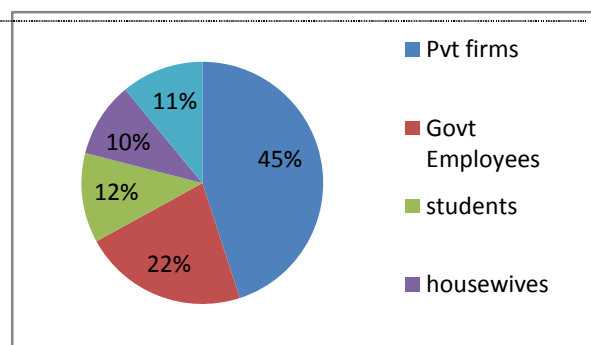


Figure 266 Occupation of users

### c. Purpose of trip by IPT

It has been observed that about 72% of the passengers surveyed said that they primarily use IPT to access work followed by social trips(18%) such as for shopping, recreational activities and even used by tourists to some extent. About 8% of the trips are used

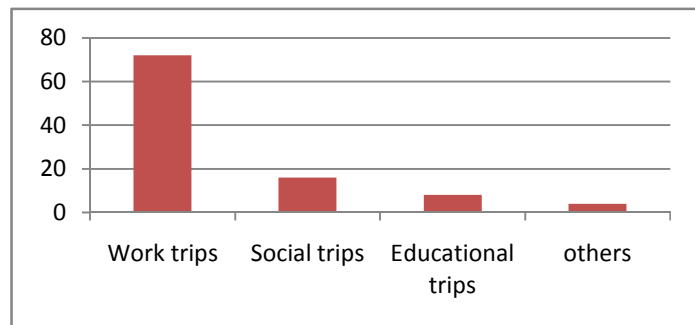


Figure 267 Trip purpose

for educational purposes followed by others(2%) such as health care. Thus we conclude that those who are using IPT in the morning and evening are most likely travelling to and from work or to and from other transport modes of transport which take them to work.

### d. Average distance travelled by passengers

It has been observed from the survey that most of the users, about 80% travel a distance of 2 to 10 km by the IPT

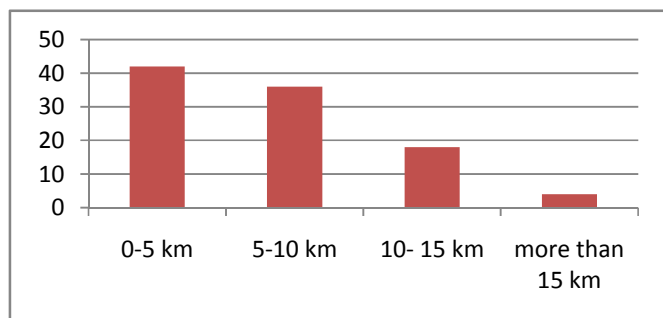


Figure 268 Average distance travelled by users

services as people use IPT as feeder to the main mode of transport. Passengers

travelling more than 10 km are around 20% and include those passengers who have their workplaces within the same suburban area and do not use local trains or buses. These long distance travels are also made by tourists in the city.

### e. Expenditure per month

It has been observed from the survey that most of the users, around 65% spend up to Rs 1000/ month on the IPT services. These are usually working professionals

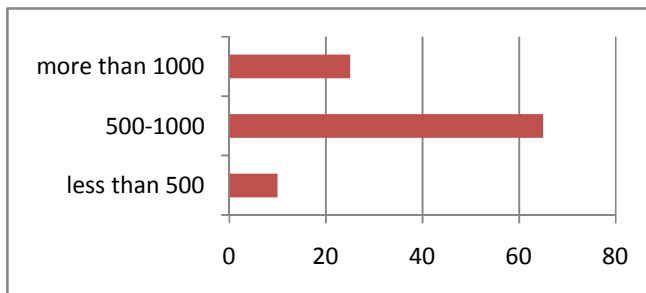


Figure 269 Expenditure per month in Rupees

who daily use the service for their work trips. About 25 % spend more than Rs 1000/ month while only 10% of the users spend up to Rs 500 on the IPT services.

### f. Safety and Security

It has been observed that more than 80% of the users are not satisfied with the safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher especially for females and elderly.

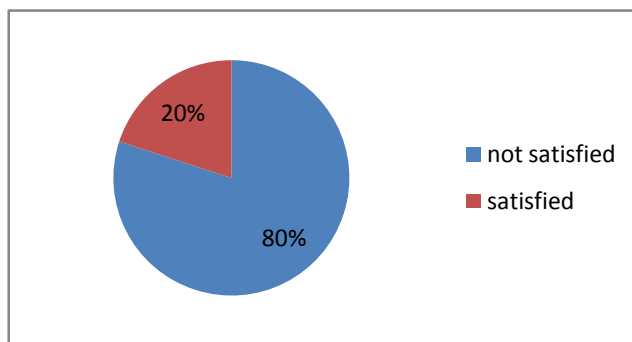


Figure 270 safety and security mechanism in IPT vehicles

The users also stated that sometimes they misbehave and refuse to go by meter during night and for short distances.

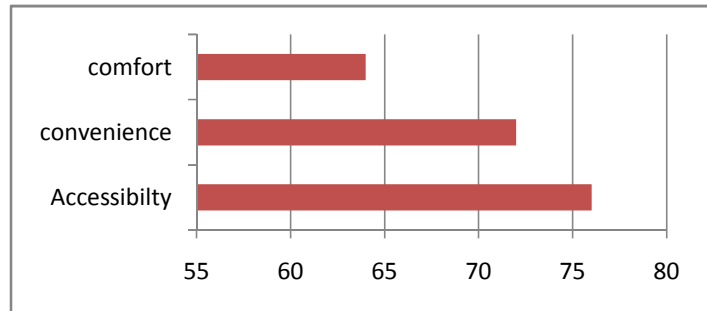
### g. Reason for usage of IPT other than Public Transport

This criterion was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. The following are the characteristics associated for the usage of IPT.

- 1. Accessibility:** Accessibility of IPT was found to have been the most likely reason for preference over public transport. Around 76% of the respondents stated this reason as the 3 seater auto rickshaw can be found easily at every corner of the street.
- 2. Convenience:** Another characteristic associated with their preference was convenience. Around 72% respondents find IPT to be more convenient again for the main reason being its easy availability. Also the waiting time for these IPT are generally lower



compared to the public transport therefore the overall journey becomes very convenient. They also provide door to door service and are



faster than the bus.

- 3. Comfort:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. 62 % of the respondents using the service in Mumbai said that it is comfortable.

Figure 271 Reasons for usage of IPT

#### h. Other suggestions for organizing the services of IPT

- Usage of modern technology- Though fares are fixed but are often bargained by the users and operators. Therefore, about 80 % of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally. The GPS would also enhance the accessibility and easy tracking of the IPT.

- When users were made aware of the usage of panic button, dial a rickshaw services then about 72 % passengers were willing to use the services. The other 28% believes that there will be extra transaction charges

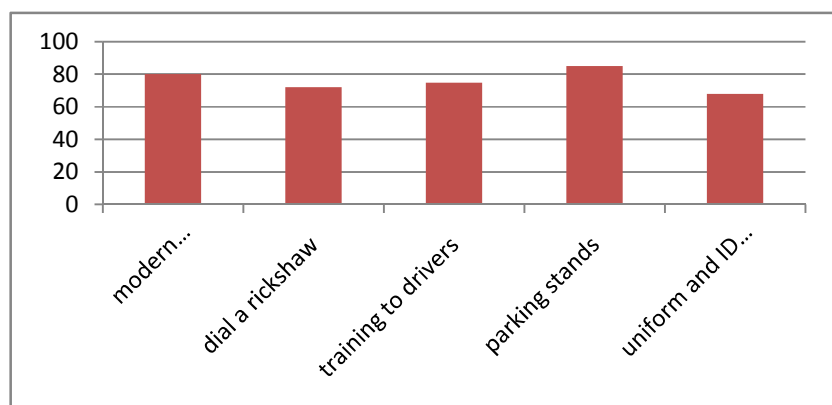


Figure 272 Other suggestions

associated with the modern technology used, as a result people would not prefer to use the services.

3. Training to drivers on road safety and driving skills were also agreed upon by about 75 % of the users. As the drivers often drive rashly according to passenger's perception.
4. 85% of the users suggested to build the dedicated parking areas for IPT as their illegal parking on the streets create traffic congestion and chaos.
5. About 68% of users agreed that uniform dress code and identity card to all drivers to make it safe for users using the services for easy identification of the drivers.

#### **i. Summary of the findings from the user survey**

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1. Most of the users stated that auto rickshaw drivers often refuse to go by meter during night and for short distances.
2. Safety and security mechanisms are missing, therefore the users especially females and elderly do not feel safe to use the services during night.
3. Most of the users also suggested making auto rickshaw helpline number to enhance the security and safety of passengers.
4. Lack of designated stands and parking areas leading to congestion.
5. Non availability of IPT services at night is also a major issue for commuters.

# City Analysis-Kochi

## City Profile - Background

Kochi, the commercial capital of Kerala consists of the Kochi Municipal Corporation, Two Municipalities and thirteen adjoining Panchayats. Kochi witnessed a rapid population growth during the past 30 years. The average decadal growth in Cochin Corporation is 7.83% whereas the nearby municipal areas registered decadal average of 18.65%, and the adjoining Panchayaths had an average decadal growth of 12.13%. The Semi-urban areas around the city is showing high rate of population growth and also fast developing trends. The population of the city according to the 2011 census is 6, 12,343.

## Transport scenario

The modes of transportation in Kochi available are the buses, cars, two wheeler and IPT. The buses contribute about 14% of the vehicular trip. The share of cars in terms of vehicular trip is about 35%. The two wheelers contribute about 35% of the vehicular trip and auto rickshaw constitute about 13% of the vehicular traffic.

## IPT System

The type of IPT functioning in Kochi is

### Auto rickshaw (3 seater capacity) –

These 3 seater capacity auto rickshaw can be easily seen on the streets of Kochi. These are privately run intermediate modes of transport providing point to point transport for the general public. They are generally used by users as an access or egress mode to the formal PT system or are also used as a competitor to public transport or as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another.

The auto's in Kochi are supposed to be in green and yellow colour since the government wants to reflect the greenery of the city and its nearness to sea through the colour of the auto's.

## **Regulatory bodies**

The Regional transport authority (RTA) and the city traffic police are the main regulatory body.

The city traffic police are responsible for enforcing the traffic rules and other laws whereas the RTA is responsible for fixing the fares and issuing license, badge & other permits.

## **Routes and fares**

The fares are fixed by the RTA. The revision of fare is done based on increase in cost of fuel but not on a regular basis. The last fare revision was done in 2012. The fare charged is Rs15 for first 1.25 km. Beyond the minimum the rate will be Rs8 per km and Rs2 per 250meters or part thereof.

## **Issue of Permits and its renewal process**

The permit for IPT is issued by the RTO at a payment of Rs.350 along with the following documents:

- Filled application form to the Regional Transport Officer.
- Residence Proof
- Age proof certificate
- Insurance certificate
- Filled PCOP form
- Driving license

The time taken for processing is about 1 week from the date of application.

## **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988 and Kerala State road safety act 2007.

## **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. There are a very few auto rickshaw stands in the city but the majority of those are demarcated by the auto unions themselves

based on the availability of road space on each route, resulting in queuing at critical junctions and thus contributing to congestion levels. There are no dedicated lanes for the rickshaw drivers. Also there are no government registered workshop or repairing shops provided by the government for the repair of IPT vehicles.

### Vehicle characteristics

The IPT running in Kochi are 2 stroke and 4 stroke IPT running on petrol, LPG & diesel. The number of IPT running on LPG is larger than those of diesel and petrol.

### Sample size for Auto rickshaw drivers and users survey

Surveys were carried out for drivers and users of IPT in the city of Kochi. 100 surveys for drivers and user were conducted through random sampling method at few of the locations based on the busiest, medium and low used routes of city. Survey locations are fort kochi ferry terminal, Boat jetty, KSHB Revenue towers, KSRTC ISBT, Rly station, corporation of kochi bus stand, Sikkim Maanipal University and Kakkanad.



Figure 273 Survey Locations

### Drivers Survey

### a. Ownership of Vehicles

About 65% of the drivers surveyed at various locations of the city stated that they have rented the auto rickshaw they drive. Ownership in Kochi is 35%. It is also observed that out of the owners majority owns about 2-4 IPT. Also the rent paid by the drivers to their owners Rs250 per day.

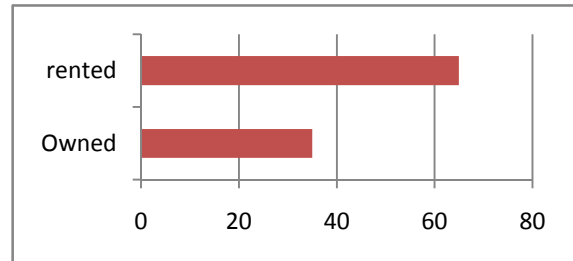


Figure 274 Ownership of vehicles

### b. Revenue earned per day

58% the drivers stated that the revenue collected per day varies between Rs500- Rs700, the average earning being Rs600, whereas 32% of the total respondents said that the revenue they collected varies between 300-500 earning an average revenue of Rs400. 10% of the drivers said that their daily revenue ranged between Rs 700 to Rs900 the average being Rs800. Also the IPT that are rented have to pay an amount of Rs250/day. The auto drivers can earn extra revenue by issuing a school permit as an auto driver earns Rs200-R300/student/2 km. Thus taking an average distance of 6kms a driver carrying 3 student earns Rs2250 per month

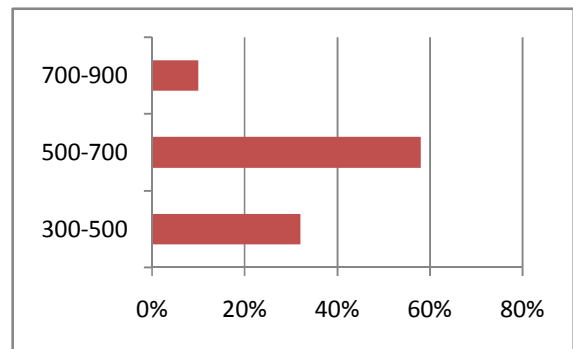


Figure 275 Revenue earned per day

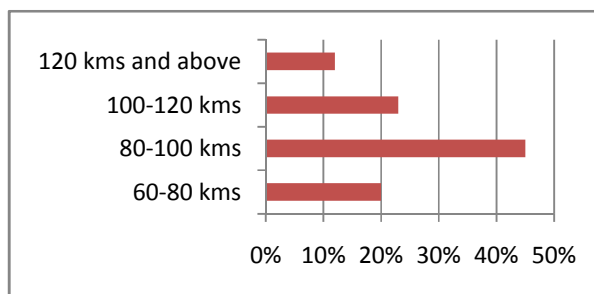
**Table 5 Revenue earned per month**

Description		Average earnings (Rs)	Average earnings per month(Rs)	Rent/day (Rs)	Total earnings per month(Rs)
Income in case of rented auto rickshaw	Private service	600	18000	250	10500
Income in case of owned auto rickshaw	Private service	600	18000		18000
Income in case of rented auto rickshaw running on profitable routes	<b>Private service</b>	800	24000	250	16500
Income in case of owned auto rickshaw running on profitable routes	<b>Private services</b>	800	24000		24000

**c. Average length travelled by auto per day**

20% of the total respondents said that they travel a total of about 60-80 kms per working day, 45% said 80-100 kms, 23% said 100-120 kms and about 12% run more than 120 kms.

But the above stats depended on whether one prefers to roam and run more empty kilometers looking for passengers, or save fuel expenses and wait empty for longer duration on the stands



**Figure 276 Average distance travelled by auto per day**

#### d. Passengers travelled per day per auto

It is stated that about 22% of drivers carry between 20-30 passengers per auto per day. 48% Of the rickshaw drivers carry 30-40 passengers per day per auto. On few occasion this number can fall to less than 10 passengers, but this rarely happens. In the outskirts of the city this number can go above 50 due overloading of the rickshaws.

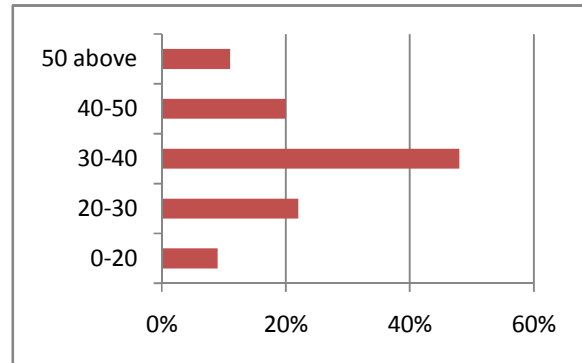


Figure 277 Passenger travelled per day per auto

#### e. Funding Provisions to operators

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents required by the banks to finance the loan (refer to earlier chapters). Hence the driver feels it easy to resort to a private financier

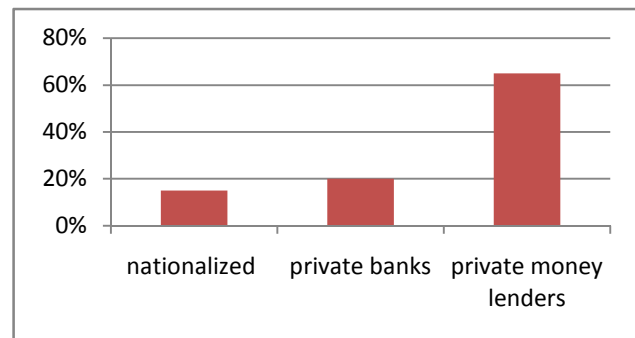


Figure 278 Financing IPT

even though the financier charges higher interest of 20 -25% as compared to nationalised banks which charge from 10.5- 12.5% The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 73% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks.



**f. Maintenance cost of vehicles.**

For 2 stroke IPT

About 58% of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 1000 to Rs 2000. The average maintenance cost is Rs 2500. 22% stated that the cost of maintenance of the vehicle per month is Rs 2000- Rs 3000 as the driver use good quality spare parts.

For 4 stroke IPT

About 62% of the drivers stated that the maintenance cost of vehicles per month is approximately between Rs 2000 to Rs 3000. The average maintenance cost is Rs 2500. 20% stated that the cost of maintenance of the vehicle per month is Rs 1000- Rs 2000.

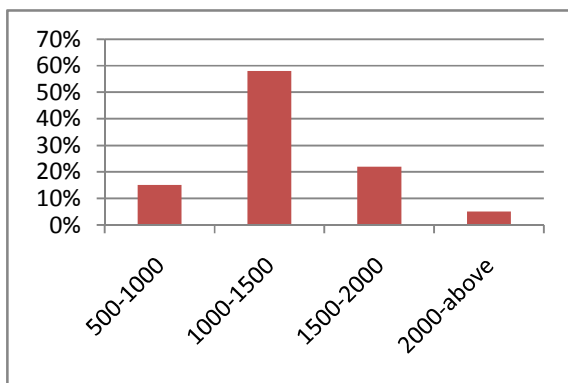


Figure 280 Maintenance cost (2 stroke)

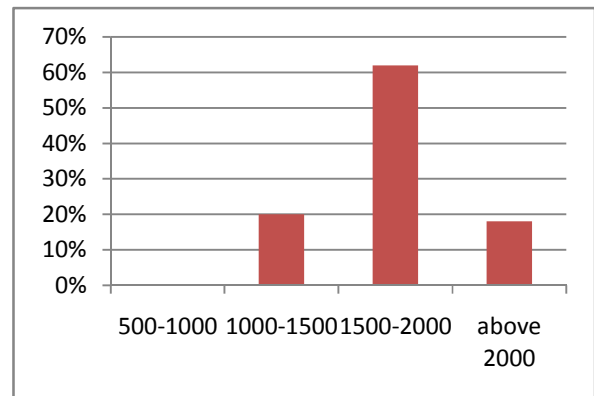


Figure 279 Maintenance cost (4 stroke)

**g. Other charges/bribes/penalties**

The traffic police levy fines on auto drivers in cases of traffic violation. Absence of adequate documents and standing in no parking areas were the major causes for fines according to the driver’s interview conducted through the survey

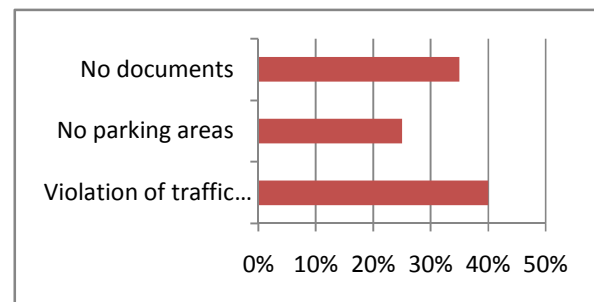


Figure 281 Reasons for bribes/penalties

it was found that 40% of the total fines were due to violation of traffic rules by the auto drivers and 35% of the total fines were because the auto drivers did not possess the required documents. Only 25% of the fines charged were because of the parking in no parking areas since Kochi has got rickshaw stands at few places in the city.

#### **h. Association with unions**

There are about 100 big and small auto unions in Kochi, the lead union being the BMS and CITU. These unions charge a small amount of Rs10 per month to the drivers who associate themselves to it. In Kochi political parties are linked with the auto unions and therefore union is just another method for earning money for their political parties.

Drivers are not very happy associating with the trade unions as they do not provide any benefits to drivers other than organizing strikes during fare hikes.

**Table 2. Table indicating the income and expenditure of drivers**

<b>Descriptions</b>	<b>Total earnings per month (Rs)</b>	<b>Maintenance cost (Rs)</b>	<b>Fines and penalties (Rs)</b>	<b>Total expenditure (Rs)</b>	<b>Total Revenue per month (Rs)</b>
Income in case of rented auto (2 stroke)	10500	1400	1100	2500	8000
Income in case of rented auto(4 stroke)	10500	1700	1100	2500	7700
Income in case of owned auto (2 stroke)	18000	1400	1100	2500	15500
Income in case of owned auto(4 stroke)	18000	1700	1100	2500	15200
Income in case of rented auto running on profitable routes (2 stroke)	16500	1400	1100	2500	14000
Income in case of rented auto running on profitable routes (4 stroke)	16500	1700	1100	2500	13700

Income in case of owned auto running on profitable routes (2 stroke)	24000	1400	1100	2500	21500
Income in case of owned auto running on profitable routes(4 stroke)	24000	1700	1100	2500	21200
Income in case of rented auto (2 stroke)+school permit	10500+2250	1400	1100	2500	10250
Income in case of rented auto(4 stroke)+school permit	10500+2250	1700	1100	2500	9950
Income in case of owned auto (2 stroke)+school permit	18000+2250	1400	1100	2500	17750
Income in case of owned auto(4 stroke)+school permit	18000+2250	1700	1100	2500	17450
Income in case of rented auto running on profitable routes (2 stroke)+school permit	16500+2250	1400	1100	2500	16250
Income in case of rented auto running on profitable routes (4 stroke)+school permit	16500+2250	1700	1100	2500	15950
Income in case of owned auto running on profitable routes (2 stroke)+school permit	24000+2250	1400	1100	2500	23750
Income in case of owned auto running on profitable routes(4 stroke)+school permit	24000+2250	1700	1100	2500	23450

\*the revenue received by school renting is Rs250 for 2km per month per passenger. Taking the number of passengers to be 3 travelling a distance of 6km

\*\*maintenance charges are taken per month

\*\*\*miscellaneous charges include the daily expenses, fines, bribes etc.

#### i. Other problems

- 
1. The number of diesel pumps in the city is inadequate and shall be increased as it leads to increase in waiting time and a potential loss of income.

2. There number of government authorized workshops in the city is inadequate.
3. No social benefits are given like training benefits, housing, medical facilities, and education facilities
4. The police officials and passengers do not give adequate respect to the auto drivers
5. The fares were last revised in 2012 and since then it has not changed even though the fuel prices have increased. Thus the drivers want a system to be bought in place like that of Mumbai where the fares increase automatically with increase in fuel price.

**j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better

**Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 80% respondents in Kochi suggested for provision of dial an auto rickshaw service so that they can easily get access to customers rather than roaming around empty in search of passengers. They also wanted the number of diesel filling stations to increase because their number is less and they have to wait in long lines to fill diesel in their rickshaws.

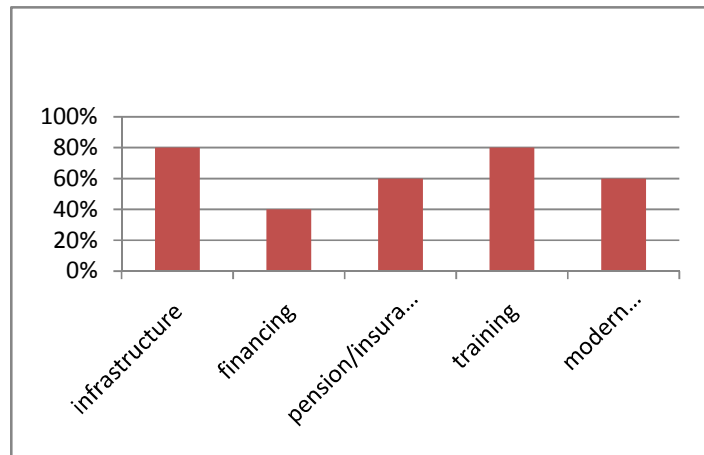
**Financing**

The drivers wanted the government to come up with an easy financing solution benefiting both the government and the auto drivers since the auto drivers have to pay a huge amount in the form of rent to the vehicle owners. This becomes more difficult due to the fact the earnings of the drivers is not fixed. 40% of the drivers want believe that it would be better if government

comes up with beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

### **Pensions/Insurance**

About 60% of auto rickshaw driver feels that insurance should be given to them as they provide services to the general public.



### **Training Programmes:**

About 80% of respondents in Kochi undergo training and educational training programmes for providing better service to customers.

**Figure 282 suggestions for improvements**

### **Usage of modern technology**

60% of the auto drivers of Kochi believe that there is no need of modern gadgets or technologies to be installed in their vehicles because it will unnecessarily add to their cost and not increase their revenue.

### **k. Summary of findings from drivers survey**

1. According to minimum wage of Kerala an auto driver shall earn Rs3630 per month but as seen from the survey rickshaw drivers of Kochi earn well above this level. Table 1 & 2 refer).
2. It is also seen from the survey that maintenance cost is higher for four stroke engines (average Rs 1500 per month) as the spare parts are expensive and the drivers therefore prefer to buy local parts from the markets, leading to greater number of breakdowns and faults.
3. They city has few rickshaw stands but their number needs to be increased.

4. There are IPT still running on diesel in Kochi but the city does not have adequate number of diesel filling stations.
5. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 20-25%. But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.
6. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.
7. Removal of political parties influences from the IPT unions as these are just an additional source for providing funds to the parties rather than providing benefits to the drivers.
8. The number of unregistered IPT in the city is growing at a rapid rate and the government shall take appropriate measures to stop this increase.

## Users survey

### a. Age group of users

From the survey it has been observed that all age groups of people use the IPT services. About 70% of the surveyed users belong to the age group 20 to 40 years. Only 25 % belongs to the age group between 40- 50 years. Above the age group of 50, only 10% uses the service. Therefore the IPT services are mostly used by the working population.

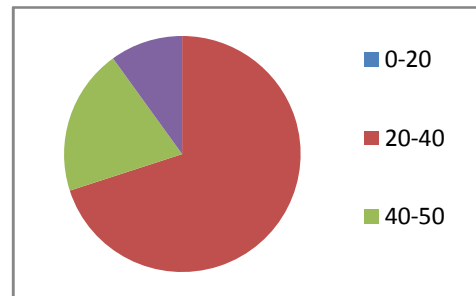


Figure 283 Age group of users

### b. Occupations of users

From the survey it is observed that more than 40 % of the users belong to the private firms. About 14 % of the government uses IPT services, students account for 16% and 14% to housewives.

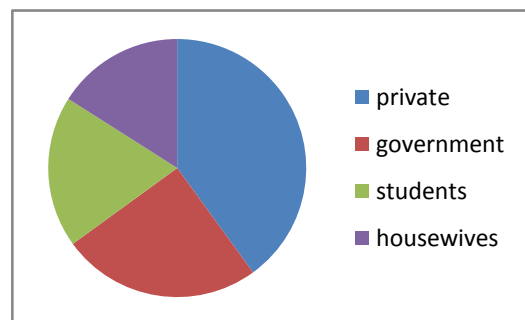


Figure 284 Occupation of the users

### c. Purpose of trip by IPT

It has been observed that 40 % of the trip purposes for which these IPT services are used are for work purpose and 55% for social purpose. Only 5% uses for educational trips.

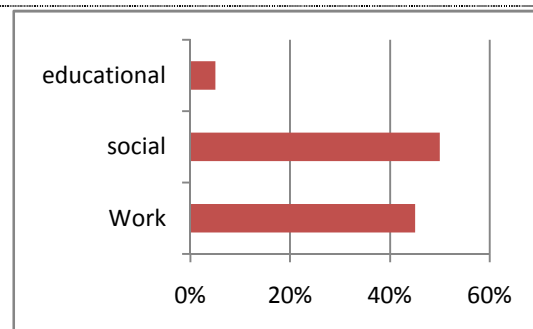
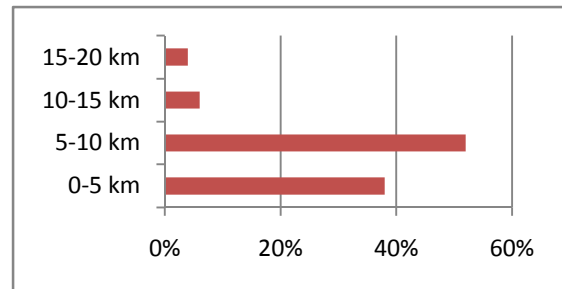


Figure 285 :- Purpose of the trip

**d. Average distance travelled by passengers**

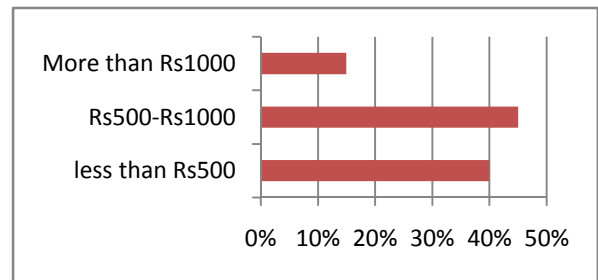
It has been observed that 90% of users travel by IPT for a small to medium distance trips of not more than 10 kms. However only about 10% of the users travel more than distance of 10 kms and above



**Figure 286 Average distance travelled by the passenger**

**e. Expenditure per month**

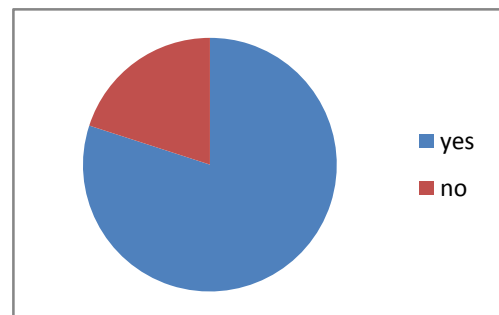
From the survey it has been observed that about 95 % of users spend less than Rs1000 per month for using IPT services. This is because most of the passengers use IPT for smaller distances. However, only 5 % spend more than Rs 1000, as these passengers travel more distance.



**Figure 287 Expenditure per month**

**f. Safety and Security**

It has been stated that 80% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher. But another 20% of people are of the opinion that autos are safe modes of travel as they run on shared basis.



**Figure 288 Safety and security**

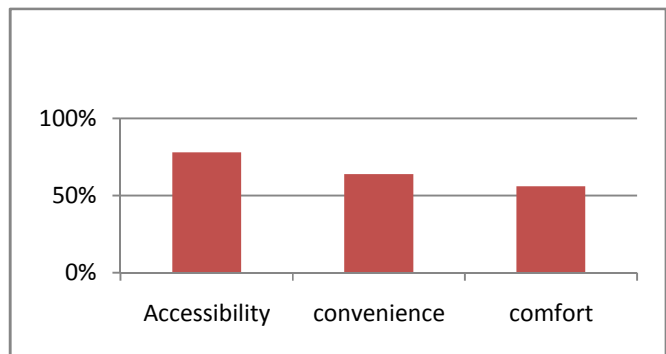


**g. Reasons for usage of IPT other than Public transport**

This criterion was mainly aimed to know why the passenger uses auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

1. **Accessibility:** Nearly 78% respondents found IPT to be more accessible. The main reason being availability of auto rickshaw whenever required at all locations, though night services are not provided.

2. **Convenience:** Another characteristic associated with their preference was convenience. Around 64% respondents find IPT to be more convenient again for the main reason being its easy



availability. Also the waiting time for these IPT are generally lower compared to the public transport therefore the overall journey becomes very convenient.

Figure 289 :- Reasons for choosing IPT

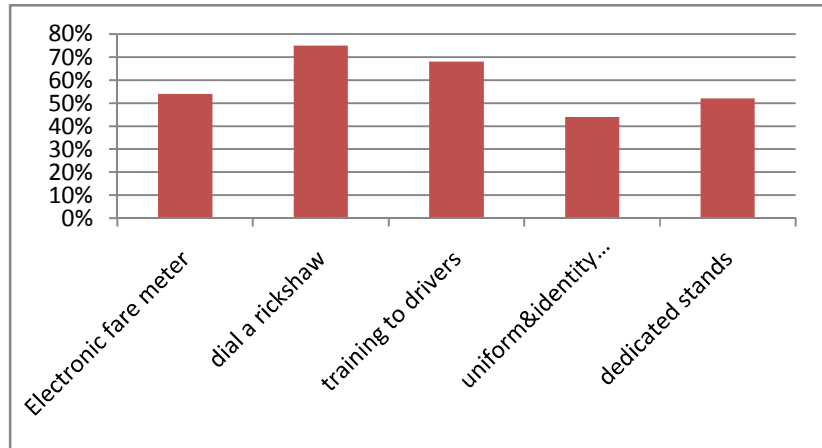
3. **Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. 56 % of the respondents using auto in Kochi said that it is comfortable. However few users complain of dis comfort as more passengers are illegally carried and also in off-peak hours passengers have to wait for a long time for an auto rickshaw.

#### **h. Other Suggestions for organizing services of IPT**

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1. Usage of modern technology- About 40% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.

2. Proper checks of papers shall be made on regular intervals for auto drivers in order to stop the movement of unregistered IPT.



**Figure 290 :- Other suggestions**

3. There should be a help line number where passengers can complaint against mis behaving auto drivers.
4. Training to drivers on road safety and driving skills were also agreed by about 70 % of the users. As the drivers often drive rashly according to passenger's perception.

#### **i. Summary of findings from Users survey**

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1. Charging of higher fares as the fare meters do not work properly, leading to dispute between users and drivers.

2. Due to absence of dedicated auto rickshaw stands and parking areas often there is found chaos and congestion on roads.
3. Long waiting time at certain locations in search of passengers leads to discomfort of commuters.
4. Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services after evening.

# City Analysis- Jammu

## City Profile - Background

Jammu, the city of temples and the winter capital of J&K state, is a symbol of ancient values and present aspirations. The city has in recent years, faced unprecedented growth of population due to influx of migration from the Valley and rapid growth of commercial and industrial activities. According to the 2011 census Jammu has a total population of 11.55 million.

## Transport scenario

There are five predominant modes of public transport in Jammu, i.e. mini-buses; matador - 407TATA; buses; taxis and auto-rickshaws.

Mini-buses: The mini buses with carrying capacity of less than 10 passengers ply within the city on routes fixed by the RTO. Matadors with carrying capacity of twenty passengers, ply in the city outside the old city area. Government Road Transport Corporation is not providing any city service. Private and Government buses ply only on intercity/inter-state long routes. Auto-rickshaws ply within the city to carry local passengers from one locality to other.

Amongst the different modes, cars/taxis had the maximum share (32.5%), whereas, the para-transit has the lowest (2.5%) contribution.

The total number of registered autos in the city is 4645 approx.

## IPT System

The types of IPT functioning in Jammu

### Auto rickshaw (3 seater capacity) –

This type of auto rickshaw is the commonly found auto rickshaw which operates as personally hired vehicle. It provides connectivity from one destination to another in the city on a pre-decided per km meter based fare system. . 3 seater capacity IPT also ply as “shuttles” in some areas accommodating more than 3 passengers to even 6 passengers as an illegal practice,

## **Regulatory bodies**

The RTO, state transport authority and City traffic police are the main authorities looking after the regulatory issues in the city. The RTO has stopped issuing permit for the auto drivers from the past 6-7 years.

## **Routes and fares**

The routes of IPT are fixed by the RTO and they have to ply inside a 15km radius.

Routes are fixed by the state transport authority. For the first km travelled the passenger is liable to pay Rs17 and Rs13 for every subsequent km to the driver. The waiting charges is Rs25 per hour

## **Issue of Permits and its renewal process**

The permit for IPT is issued by a three member committee comprising of RTO, SSP traffic police and DC, Jammu police. The driver has to pay Rs150 for receiving the permit.

The following documents are required for a person if he wishes to apply for a rickshaw permit in Jammu

- Residence Proof
- Minimum 8th standard Pass certificate
- Court stamp Rs.10 Rupee
- Driving license
- Fitness certificate
- Insurance - vehicle insurance
- Pollution under control certificate.
- Meter No / Bill. Meter should be compulsory
- Permit fee

The time taken for processing is about a month from the date of application. The permit is renewed after every 1 year at a payment of Rs150. In case of late application the Rs1155 is charged as fine.

### **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act.

### **Infrastructure for IPT**

At present there is virtually no planning for IPT in the city. Though IPT stands and few dedicated tracks have been provided by Municipal Corporation at few locations of the city, but they are currently inadequate and at many places inappropriate. Also these are blocked by encroachment. Therefore IPT still queue up seeking potential passengers at critical junctions, thus contributing to congestion levels. Also no workshops or repairing shops are provided for repair of IPT Vehicles.

### **Vehicle characteristics**

About 60 % of the IPT within the city limits of Jammu are 2 stroke autos using petrol are fuel and the rest 40% are 4stroke autos using petrol. This is because the average maintenance cost per month in case of 4 stroke engines is Rs 1500 whereas in case of 2 strokes the average cost per month is Rs750.

### **Sample size for Auto rickshaw drivers and users survey**

Surveys were carried out for drivers and users of IPT in Jammu city, 60 surveys for drivers and user surveys through random sampling method were conducted at important locations of Jammu, for the research purpose. Survey locations were selected according to major locations where presence of IPT and its movement and on some of the busiest areas like CPO chowk, Bakshsinagar, Bus Stand circle, Canal Road, Jammu Tawi Railway station and Narwal.



Figure 291 1 Survey Locations

## Drivers Survey

The driver survey was carried out from the perspective to understand the ownership, daily operations, maintenance, leasing and financial aspects of auto rickshaw industry from driver's view, to understand issues and challenges faced by the driver in the industry and to get their opinions and suggestions to improve operations of the auto rickshaw services in the cities.

**a. Ownership of Vehicles**

About 40% of the drivers surveyed at various locations of the city stated that they have rented the auto rickshaw they drive. Ownership in Jammu is 60%. The main reason being that, they do not

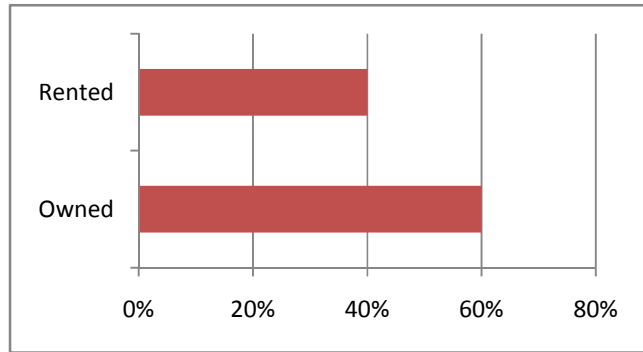


Figure 292 Ownership of vehicles

have not enough money to purchase an auto rickshaw and purchasing an auto

rickshaw through a loan from banks is a lengthy and a tedious process due to too much documentation required. The rent paid by the drivers to their owners is Rs120 for an older auto an Rs180 for a new auto. This difference can be understood since the maintenance cost of an old auto is less than that of a new auto.

**b. Revenue earned per day**

45% the drivers stated that the revenue collected per day varies between Rs200-Rs300. The average earning per month is Rs7500. However of about 28% of the shuttle drivers said that the revenue collected per day varies between Rs300 to Rs400. The average income earned per month is therefore Rs 10,500. The main

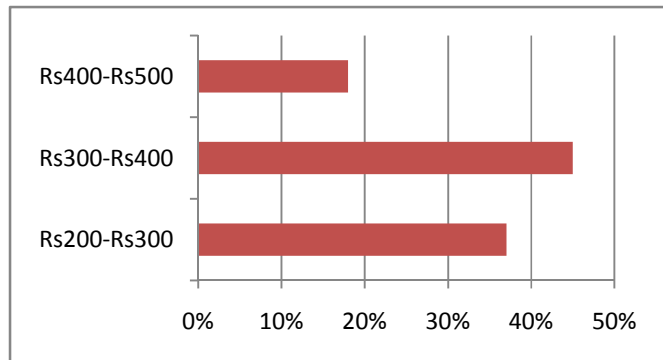


Figure 293 Revenue earned per day

reason for such why the drivers in the city earn less is because people prefer the matador service for work and educational trips over IPT. 18% of the auto drivers who earn between 400 to 500 illegally carry more passengers than they are permitted

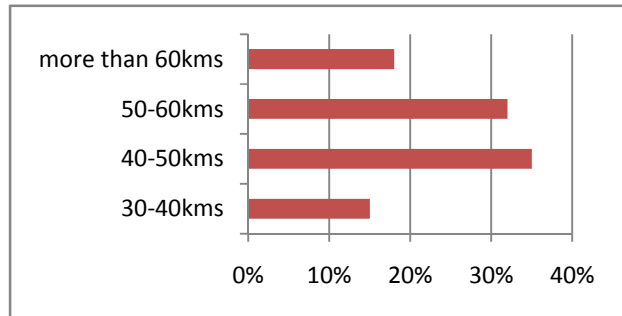


**Table 1 Revenue earned per month**

Descriptions			Earning per day(Rs)	Average earning per month(Rs)	Rent per day (Rs)	Total earning per day (Rs)
<b>Income in case of rented auto rickshaw</b>	Private service	New autos	350	10500	180	5100
<b>Income in case of owned auto rickshaw</b>	Private service		350	10500		10500
<b>Income in case of rented auto rickshaw</b>	Private service	Old autos	350	10500	120	6900
<b>Income in case of owned auto rickshaw</b>	Private service		350	10500		10500
<b>Income in case of rented auto rickshaw plying on profitable routes</b>	Private service	New autos	450	13500	180	8100
<b>Income in case of owned auto rickshaw plying on profitable routes</b>	Private service		450	13500		13500
<b>Income in case of rented auto rickshaw plying on profitable routes</b>	Private service	Old autos	450	13500	120	9900
<b>Income in case of owned auto rickshaw plying on profitable routes</b>	Private service		450	13500		13500

**c. Average length travelled by auto per day**

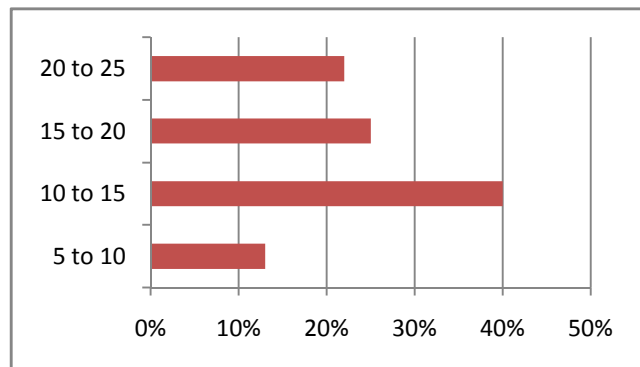
About 35 % of the drivers stated that the average length travelled by auto per day is between 40-50kms whereas 32% drive distance of 50-60kms per day.18% of the drivers said that they travelled a distance more than 60 kms. The reason for the above stated figures is that people prefer matador service to an auto service and the tourists coming to the city prefer taxi service.



**Figure 294 Average length travelled /auto/day**

**d. Passengers travelled per day per auto**

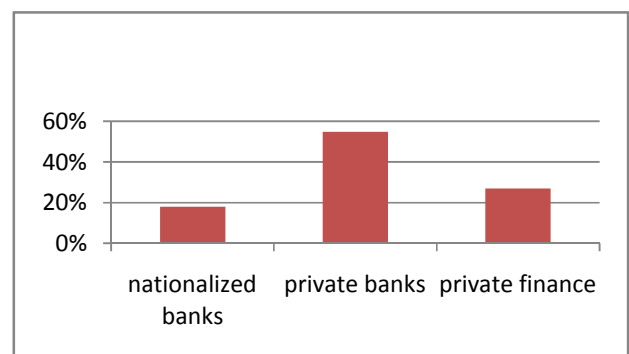
It is stated that about 40% of drivers carry about 10 to 15 passengers per day whereas 25% of the drivers carry 15 to 20 passengers daily. 22 % of drivers states that they carry between 20 to 25 passengers per auto per day. This is because the autos are not allowed to travel on shared basis.



**Figure 295 Passengers travelled per day per auto**

**e. Funding Provisions to operators**

From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents (as mentioned earlier)required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier(as mentioned earlier) even though the financier charges higher



**Figure 296 Financing IPT**

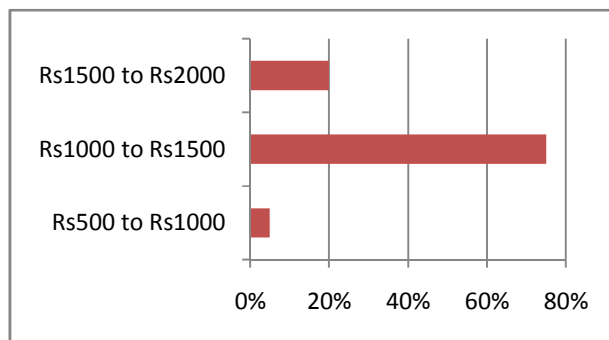
interest of 22 -25% as compared to nationalised banks which charge from 10.5- 12.5%. The only reason which tempts driver to go to a private financier is immediate availability of the auto rickshaw without any legal paper work. Thus the graph shows that due to the above mentioned reasons nearly 57% of the auto rickshaw owner drivers prefer financing through a private financier rather than approaching banks even though it being a legal procedure.

**f. Maintenance cost of vehicles.**

The maintenance cost of a 2 stroke auto rickshaw is lower than that of a 4 stroke auto rickshaw.

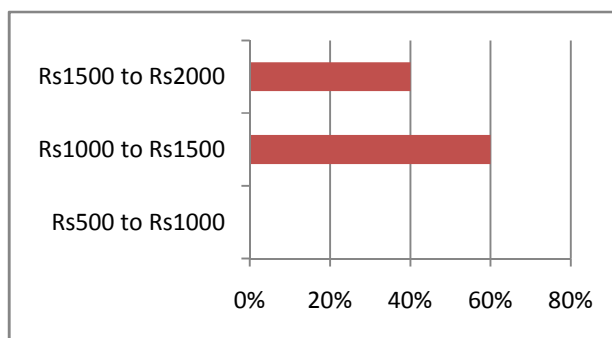
2 stroke IPT:-

75% of the auto rickshaw drivers said that maintenance cost they incur ranges from Rs1000 to Rs1500 per month. Only 20% of the auto drivers said that the maintenance cost lies between Rs1500 to Rs2000 whereas it was only 5% of the drivers who spent about Rs500 to Rs1000 on maintenance of their auto.



**Figure 297 Maintenance cost for 2stroke**

The reason for high maintenance cost is that the drivers still drive old IPT. The average maintenance cost for a new 2 stroke auto rickshaw is 1250 and for an old one is Rs1500



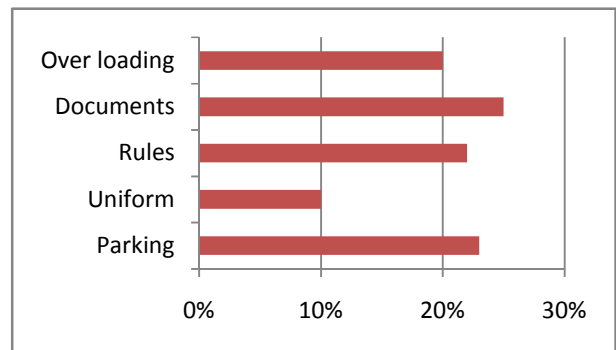
**Figure 298 Maintenance cost for 4stroke**

4 stroke auto rickshaw:-

60% of the drivers said that they incur a maintenance cost between Rs1000 and Rs1500 whereas 40% of the drivers had to spend between Rs1500 and Rs2000 per month for the maintenance of their vehicle. Average maintenance cost for new auto will be Rs1400 and for an old auto the maintenance cost is Rs1700.

**g. Other charges/bribes/penalties**

Fine penalties are charged on auto drivers by the traffic police and RTO's mainly for traffic rule violations. The major causes for fines as found from the driver survey was lack of documents, violation of traffic rules and



overloading of the rickshaws.

**Figure 299 Reasons for bribes/penalties**

However, the traffic penalties are often converted into a source of bribe by the city traffic officials. The illegal shuttle operations found in Jammu, as per the driver survey states that all pay a meager amount of Rs.20 to the traffic police per week in order to keep their operations continuing

**Table 2 Total income and expenditure of auto drivers**

Descriptions		Total earning (Rs)	Maintenance cost(Rs)	Bribe to traffic police(Rs)	Total expenditure (Rs)	Total Revenue per month(Rs)
Income in case of rented auto (2 stroke) old	Private service	6900	1500		1500	5400
Income in case of owned auto (2 stroke) old	Private service	10500	1500		1500	9000
Income in case of rented auto plying on profitable routes (2 stroke) old	Private service	9900	1500		1500	8400
Income in case of owned auto plying on profitable routes (2 stroke) old	Private service	13500	1500		1500	12000
Income in case of rented auto + school permit (2 stroke) old	Private service	9400	1500		1500	7900
Income in case of owned auto+ school permit (2 stroke) old	Private service	13000	1500		1500	11500
Income in case of rented auto plying on profitable routes+ school permit (2 stroke) old	Private service	12400	1500		1500	10900
Income in case of owned auto plying	Private service	16000	1500		1500	14500

<b>on profitable routes+ school permit (2 stroke) old</b>						
<b>Income in case of rented auto (2 stroke) new</b>	Private service	5100	1250		1250	3850
<b>Income in case of owned auto (2 stroke) new</b>	Private service	10500	1250		1250	9250
<b>Income in case of rented auto plying on profitable routes (2 stroke) new</b>	Private service	8100	1250		1250	6850
<b>Income in case of owned auto plying on profitable routes (2 stroke) new</b>	Private service	13500	1250		1250	12250
<b>Income in case of rented auto + school permit (2 stroke) new</b>	Private service	7600	1250		1250	6350
<b>Income in case of owned auto+ school permit (2 stroke) new</b>	Private service	13000	1250		1250	11750
<b>Income in case of rented auto plying on profitable routes+ school permit (2 stroke) new</b>	Private service	10600	1250		1250	9350
<b>Income in case of owned auto plying on profitable routes+ school</b>	Private service	16000	1250		1250	14750

<b>permit (2 stroke) new</b>						
<b>Income in case of rented auto (4stroke) old</b>	Private service	6900	1700		1700	5200
<b>Income in case of owned auto (4 stroke) old</b>	Private service	10500	1700		1700	8800
<b>Income in case of rented auto plying on profitable routes (4 stroke) old</b>	Private service	9900	1700		1700	8200
<b>Income in case of owned auto plying on profitable routes (4 stroke) old</b>	Private service	13500	1700		1700	11800
<b>Income in case of rented auto + school permit (4 stroke) old</b>	Private service	9400	1700		1700	7700
<b>Income in case of owned auto+ school permit (4 stroke) old</b>	Private service	13000	1700		1700	11300
<b>Income in case of rented auto plying on profitable routes+ school permit (4 stroke) old</b>	Private service	12400	1700		1700	11700
<b>Income in case of owned auto plying on profitable routes+ school permit (4 stroke) old</b>	Private service	16000	1700		1700	14300

<b>Income in case of rented auto (4 stroke) new</b>	Private service	5100	1400		1400	3700
<b>Income in case of owned auto (4 stroke) new</b>	Private service	10500	1400		1400	9100
<b>Income in case of rented auto plying on profitable routes (4 stroke) new</b>	Private service	8100	1400		1400	6700
<b>Income in case of owned auto plying on profitable routes (4 stroke) new</b>	Private service	13500	1400		1400	12100
<b>Income in case of rented auto + school permit (4 stroke) new</b>	Private service	7600	1400		1400	6200
<b>Income in case of owned auto+ school permit (4 stroke) new</b>	Private service	13000	1400		1400	11600
<b>Income in case of rented auto plying on profitable routes+ school permit (4 stroke) new</b>	Private service	10600	1400		1400	9200
<b>Income in case of owned auto plying on profitable routes+ school permit (4 stroke) new</b>	Private service	16000	1400		1400	14600

\*average of maintenance cost per month taken



\*\* advertisement revenue taken as Rs2500/ month ( student permit is Rs500/month charged to 5 students)

#### **h. Association with unions**

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There are around 2 to 3 unions in Jammu which are registered and work actively for the well-being of the auto drivers. The associations are trying to sustain itself by suggesting benefits to auto rickshaw drivers in terms of healthcare facilities, insurance, and education facilities for their children. However, from the driver survey, when asked the reason for being not associated with any such associations, the common answer got was that there is no such benefit as to be provided by these associations except to organize strikes during fare hikes, which is in turn negative to their business and also they have to shelve out the membership fees.

#### **i. Other problems**

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1. As per the driver's survey 52% of the drivers have obtained primary education or are illiterate. Therefore the computerized driving test becomes a problem for drivers.
2. No social benefits are given like training benefits, housing, medical facilities, education facilities

#### **j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

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In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better.

#### **Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of autorickshaw stands, parking zones, autorickshaw lanes, and terminals, provision of dial a rickshaw service) would improve their operations. 60% respondents in Jammu suggested for provision of autorickshaw stands at appropriate locations for their

improvement which enables access to get passengers easily, which in turn would also reduce the hassles they have to deal with traffic police on daily basis for encroaching the roads while waiting for potential passengers at critical locations.

### Financing

As mentioned earlier owning an auto rickshaw is not an easy option for drivers, especially new drivers. The drivers have to shelve out daily rent which decreases their revenue earnings. Hence a common criteria that both the auto rickshaw drivers and unions (73%) suggested that the legal

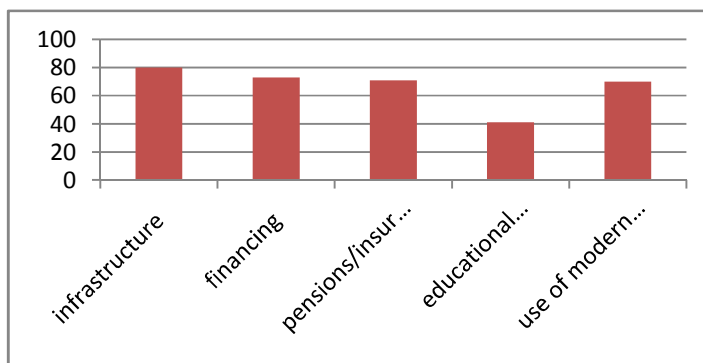


Figure 300 Suggestions for improvement

financing procedure of IPT should be made easier. And also they suggested that it would be better if government comes up with beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

### Pensions/Insurance

An auto rickshaw driver feels that though it is a business, in a way he is doing a public service, and so he should be offered benefits in terms of government scheme pensions so that he does not feel insecurity for his future. 65% respondents in Jammu feel that they should be given pension/insurance for their future security.

### Training Programmes:

About 48% of respondents in Jammu agreed to undergo training and educational training programmes for providing better service to customers.

## **Usage of modern technology**

When drivers were made aware of the modern technology of tracking vehicles through GPS and services like dial a rickshaw then 75% of the drivers suggested for such improvement to be added.

### **k. Summary of findings from drivers survey**

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1. According to the minimum wage levels of Jammu & Kashmir an auto driver shall earn about Rs5250 per month but rented auto drivers earn less than this level. Thus their condition is poor.
2. It is also seen from the above study that maintenance cost is higher for four stroke engines (average Rs 1500 per month) compared to 2 stroke engines(average Rs1250 per month), therefore drivers do not prefer to convert their vehicles to 4 stroke. But the chances of break down in a four stroke auto rickshaws are quite high and are more polluting.
3. Lack of proper infrastructure facilities like auto stands, parking areas, workshops for repairs etc.
4. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 22-25%.But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.
5. Since the educational levels are lower therefore computerized driving test are not possible to be given.

6. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.
7. Fares set by the RTO are too less and needs to be revised since it has not been done since a long time.

## Users survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 60 users on the basis of random sampling was carried out, at various locations. by selecting various characteristics that they associate with this IPT mode

### a. Age group of users

From the survey it has been observed that above 20 years all age groups of people use the IPT services. About 44% of the surveyed users belong to the age group of 30 to 40 years. Only 25 % belongs to the age group between 20- 30 years. Above the age group of 40, 31 % use the IPT. as it provides door to door services for elderly citizens.

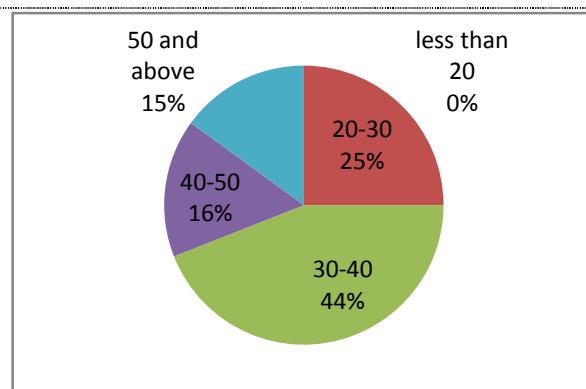


Figure 301 age profile of users

### b. Occupations of users

From the survey it is observed that more than 50 % of the users belong to the private firms, NGOs and business class. About 17 % of the government uses IPT services and about 15 % each user belong to students and house wife categories.

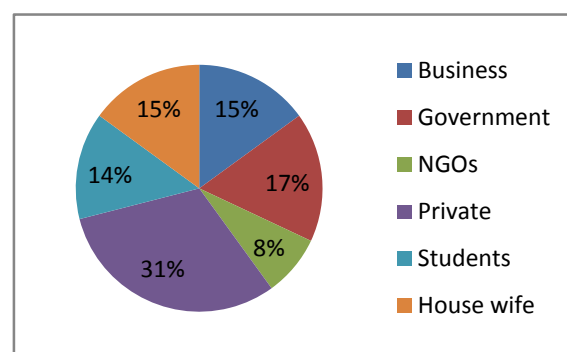


Figure 302 Occupation

**c. Purpose of trip by IPT**

It has been observed that 50 % of the trip purposes for which these IPT services are used are for work purpose and 48% for social purpose. Only 2% uses for educational trips.

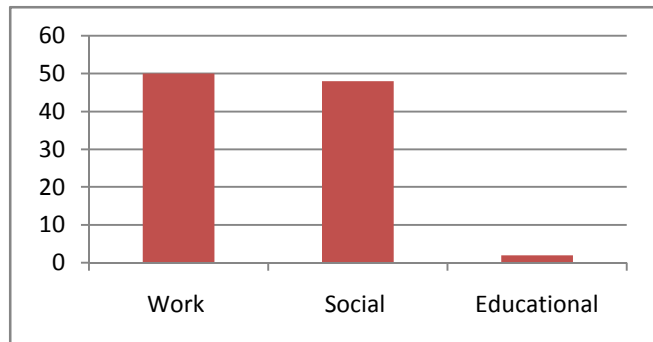


Figure 303 Trip purpose

**d. Average distance travelled by passengers**

It has been observed that majority (85%) of users travel by the IPT are for small to medium distance trips of not more than 10 kms. However about 10% of the users travel more than distance of 10 kms and above.

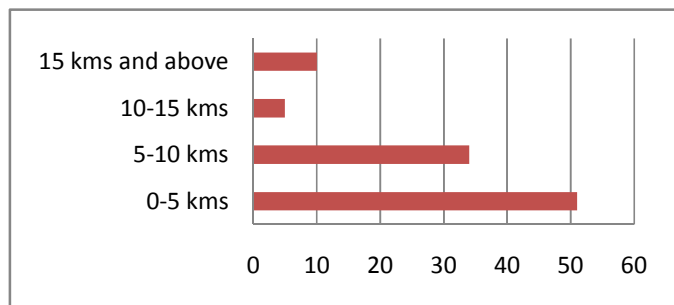


Figure 304 Average distance travelled by users

**e. Expenditure per month**

From the survey it has been observed that about 81 % of users spend monthly of not more than Rs 1000 for using IPT services. However only 19 % spends more than Rs 1000, This 19 % people were found to travel more distance as a result more money is spend on IPT.

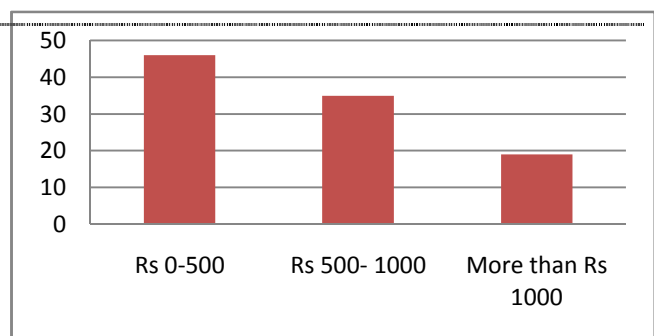


Figure 305 Expenditure per month

### f. Safety and Security

It has been stated that 86% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore very high.

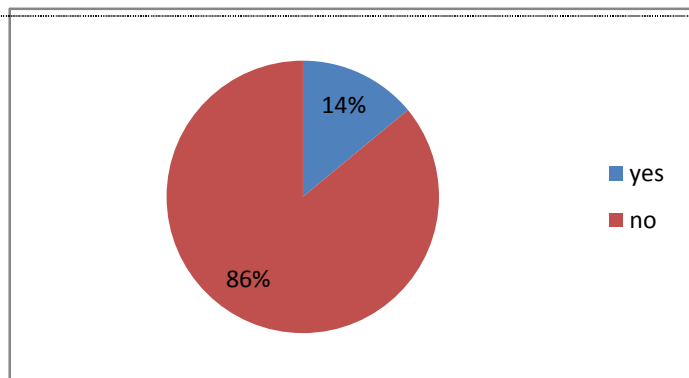


Figure 306 18 safety and security mechanism in IPT vehicles

### g. Reasons for usage of IPT other than Public transport

This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

- 1. Accessibility:** Nearly 80% respondents wanted IPT to be more accessible. The main reason being continuous availability of auto rickshaw whenever required at all locations. During the night it becomes extremely difficult to find an auto rickshaw

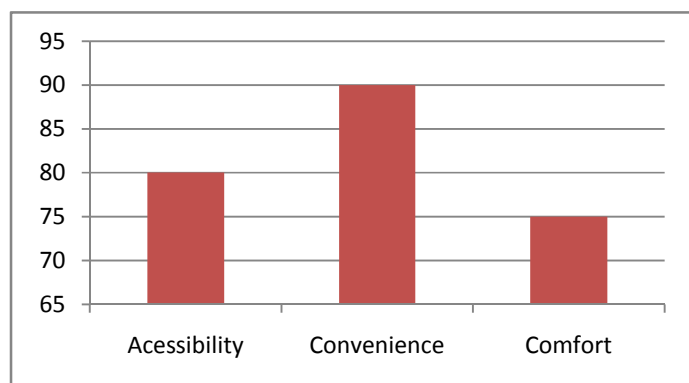


Figure 307 Reasons for usage of IPT

- 2. Convenience:** Another characteristic associated with their preference was convenience. Around 90% respondents find IPT to be more convenient again for the main reason being its easy availability. Also it provides the last mile / very near to last mile connectivity, and can be also opted for exact origin to destination connectivity, which

makes their overall journey very convenient when compared to public transport where they are required to walk and wait for the bus availability at the stop which are many times not designed properly. Also they are required to make mode interchanges at times to reach their destination which they find inconvenient

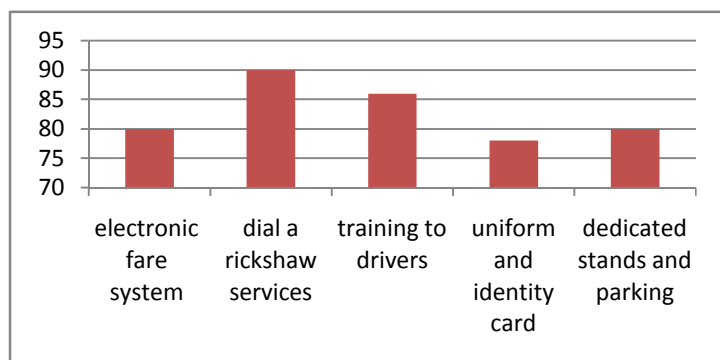
- 3. Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less commotion as compared to bus (in case of shuttle IPT), and easy availability and connectivity are main characteristics for comfort associated with the auto rickshaw. 75% of the respondents using Jammu meter auto said that it is comfortable. However the shuttle service users complain of discomfort as more passengers are illegally carried

#### **h. Other Suggestions for organizing services of IPT**

1. Usage of modern technology- About 80% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.

2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 90% passengers are willing to use the services.

3. Training to drivers on road safety and driving skills were also agreed by about 86 % of the users. As the drivers often drive rashly according to passenger's perception.



**Figure 308 other suggestions**

4. 80 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion on busy roads.

5. About 78 % of users agreed that uniform dress code and identity card to all drivers make it safe for users using the service as lot of crime takes place in the city.

**i. Summary of findings from Users survey**

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1. Charging of higher fares as the metered autos are not electronic therefore drivers often manipulate the readings leading to dispute between users and drivers
2. Due to absence of dedicated auto rickshaw stands and parking areas often there is found chaos and congestion on roads.
3. Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services after evening.
4. The users believe that the traffic police is lenient with the auto drivers and do not force them to charge appropriate fares as per the government notification.
5. Very few autos ply on the roads of Jammu in the night causing inconvenience to the users. Autos in the night can easily be found only on Railway stations and bus stations.
6. The drivers misbehave with the users when the users force them to travel by the government fares.



# City Analysis- Amritsar

## City Profile - Background

Amritsar City is one of the largest cities of Punjab. According to 2011 Census; the population of the city of Amritsar along with its urban / metropolitan agglomeration has increased to 1.18 million in 2011 from 1.01 million in 2001 registering an annual growth @ 1.57%.

The city is home to golden temple the spiritual and cultural center for the Sikh religion. This important Sikh shrine attracts 1, 00,000 visitors on week days. The Ram Tirath in Amritsar is near and dear to Hindus as it is believed that the twin sons of King Rama lived here. Transport scenario.

## Transport scenario

The city of Amritsar does not have a formal bus system to serve to the city commuters and thus the intermediate mode of transport is widely used for intra city trips. The modal share of the city is 25.9% from two wheelers, 6.63 % by cars, 22.03% by IPT 4.64% by bus( std& mini bus), 26.75% of the trips in the city are walk trips and cycle and cycle rickshaws also play a significant part in the city transportation with a total share of 13.68% in total.

The total number of registered number of IPT in the city is 18,874. (CMP 2010) But the actual number is quite high since there is large number of IPT illegally running on the streets of Amritsar. The city has the largest number of IPT per lakh population, since the city lacks a formal public transport system.

## IPT System

The operation of auto rickshaw are not restricted or regulated to serve either as contract or stage carriage. Large number of shared auto's run in the city substituting the conventional public transport.

The type of IPT functioning in Amritsar is

### **Auto rickshaw (3 seater capacity) –**

This type of auto rickshaw is the commonly found auto rickshaw which operates on shared and personally hired basis. It provides connectivity from one destination to another on pre decided route and fares fixed by unions. . These IPT run as an alternative to PT system in absence of personal vehicle as a main mode connecting from one destination to another. It also acts as a major mode for Public transport in areas of absence of public transport.

### **Regulatory bodies**

The Regional transport office (RTO) and the city traffic police are the main regulatory body.

### **Issue of Permits and its renewal process**

The RTO has stopped issuing permits from the past 5-6 years as the authority has fixed the number of registered vehicles.

The permit for IPT is issued by the RTO at a payment of Rs.300 along with the following documents:

- Filled application form to the Regional Transport Officer.
- Residence Proof
- Age proof certificate
- Insurance certificate
- Filled PCOP form
- Driving license

The time taken for processing is about 1 week from the date of application.

The permit is to be renewed every 5 years and the permit renewable fees are Rs1610.

## **Routes and fares**

The route for the IPT is fixed by the RTO.

The department of transport, Punjab is the fare fixing agency for the intermediate public transport in the state. The fares have not been revised since the last 5 years and since then the fares have increased quite a lot and taking advantage of this position the driver's charge excess fare to the passengers.

The metres in the auto rickshaw are not working and taking advantage of this the auto driver's charge higher fares to the passengers.

## **Acts and Laws governing IPT vehicles in the state**

The main acts governing the IPT vehicles are Central Motor vehicles act 1988.

According to the guidelines issued by the government of Punjab IPT shall be should be replaced on completion of 5 years from the date of registration with a brand new vehicle

## **Infrastructure for IPT**

The city has provided the rickshaw drivers with designated parking areas where they can park their vehicles, but they are very few in the city and the majority of those are demarcated by the auto unions themselves based on the availability of road space on each route, resulting in queuing at critical junctions and thus contributing to congestion levels. There are no dedicated lanes for the rickshaw drivers and nor are there any workshop or repairing shops provided by the government for the repair of IPT vehicles. More over LPG filling stations are very less.

## **Vehicle characteristics**

The IPT running in the city are 2 stroke and 4 stroke vehicles either powered by diesel or LPG. The number of 2 stroke vehicles is more than 4 stroke vehicles in the city. The government has banned introduction of diesel powered IPT in the city.

### Sample size for Auto rickshaw drivers and users survey

Surveys were carried out for drivers and users of IPT in the city of Amritsar. 100 surveys for drivers and user were conducted through random sampling method at few of the locations based on the busiest, medium and low used routes of city. Survey locations are Ram Tirath Road , Government girls college, Amritsar Junction Railway station, ISBT Amritsar, Hall Bazar, Krishna Nagar, Jallianwala Bagh

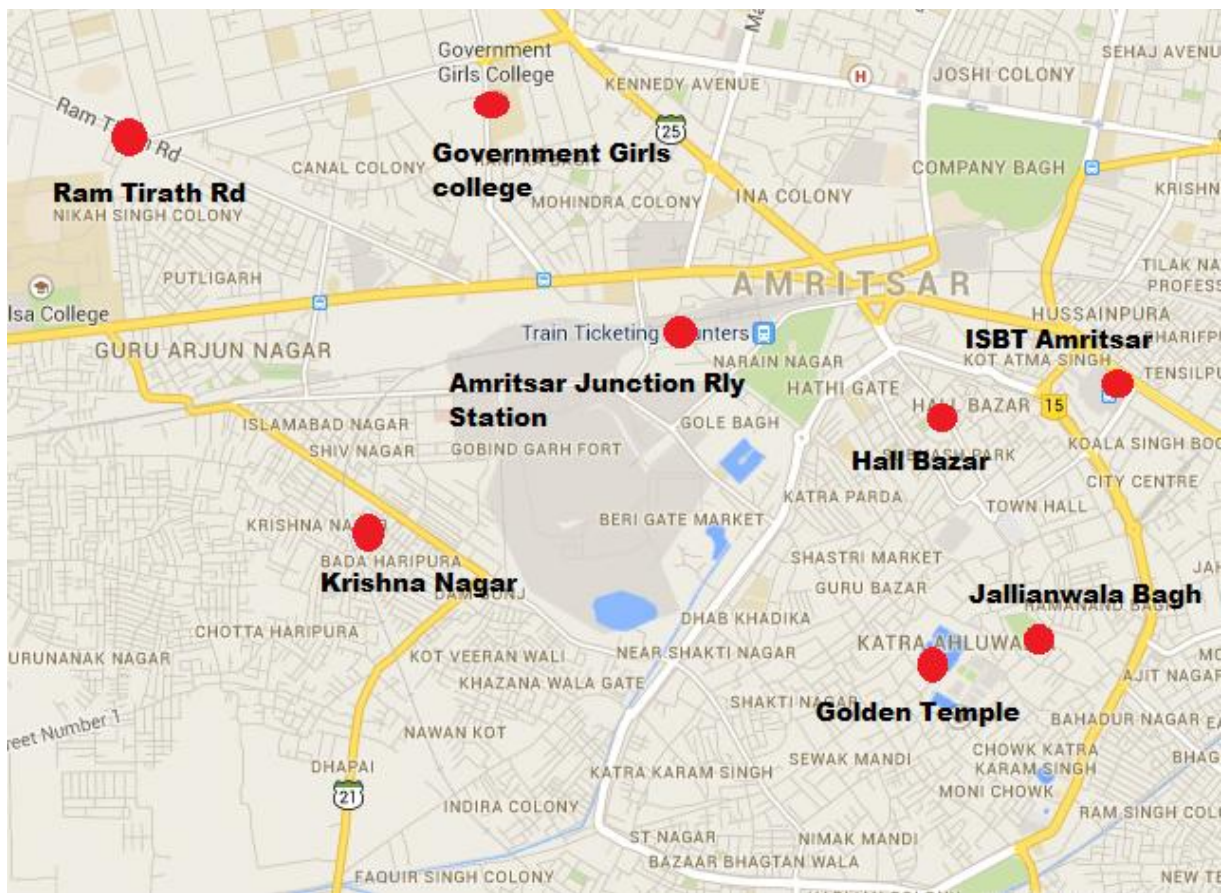


Figure 309 Survey locations

## Drivers Survey

### a. Ownership of Vehicles

There are about 60% of the rickshaws in the city that are owned whereas 40% of the IPT in the city run on rent.

It is also observed that out of the owners majority owns about 1-2 IPT. Also the rent paid by the drivers to their owners is Rs 350 per day.

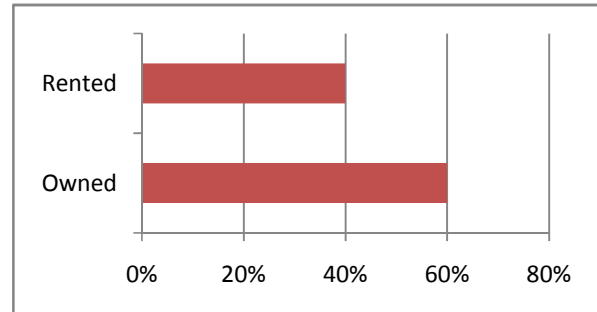


Figure 310 Ownership of vehicles

### b. Revenue earned per day

Of the total number of the drivers interviewed we found out that the revenue earned differed between those who run on private hire basis and those who run on shared basis.

Private Service:-

10% of the auto drivers said that on few off days

their revenue earning decreases tremendously and lies between the range of Rs100 to Rs400. 65% of the auto drivers said that they easily manage to earn about Rs400-Rs700 per day. 25% of the drivers said that since they worked on profitable routes they could earn up to Rs1000 per day.

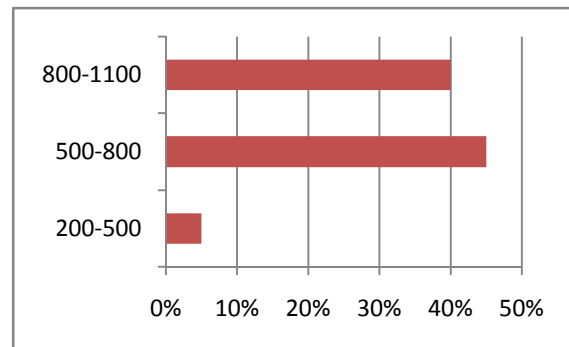


Figure 311 Revenue earned per day on private hire basis

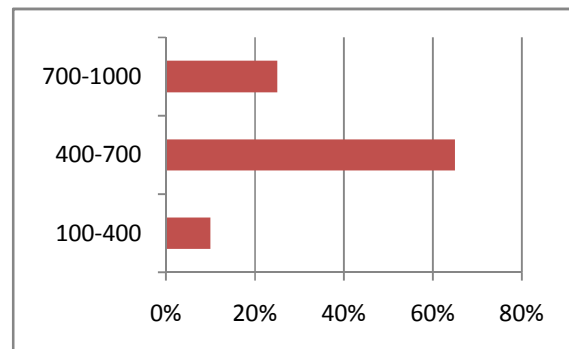


Figure 312 Revenue earned per day on shared basis

Shared Service:-

5% of the auto drivers said that their daily revenue lied between Rs200 and Rs500 since they do not ply on profitable routes. About 45% of the drivers earned about Rs500 to Rs800 whereas 40% of the drivers said that they earned above Rs800 per day since they run on profitable routes. Also the IPT have to pay Rs350 as rent per day to the auto owner per day.

Table1 :- Revenue earned

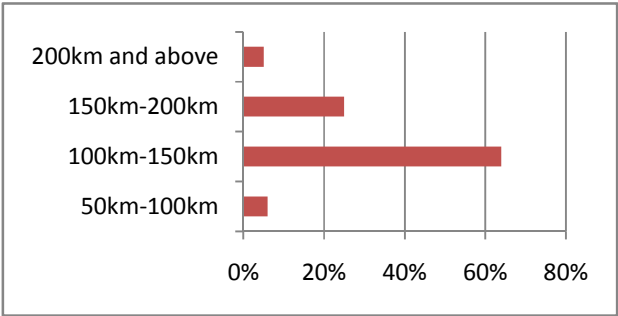
Descriptions		Earnings per day(Rs)	Average earnings per day(Rs)	Rent/day(Rs)	Total earnings per day(Rs)
Income in case of rented auto rickshaw	Private services	550	16500	350	6500
Income in case of owned auto rickshaw	Private services	550	16500		16500
Income in case of rented auto rickshaw running on profitable routes	Private services	850	25500	350	15000
Income in case of owned auto rickshaw routes	Private services	850	25500		25500
Income in case of rented auto rickshaw	shuttle services	650	19500	350	9500
Income in case of owned auto rickshaw	shuttle services	650	19500		19500
Income in case of rented auto rickshaw	shuttle services	950	28500	350	18000

<b>running on profitable routes</b>					
<b>Income in case of owned auto rickshaw running on profitable routes</b>	shuttle services	950	28500		28500

**c. Average length travelled by auto per day**

The respondents said that the distance travelled per day varied throughout the year since during the festival period many tourist visit Amritsar as this place has got great historical and religious importance.

The 64% of the drivers said that they travelled a distance between 100-150 kms a day. 30% said that they travelled a distance of more than 150 kms a day while only 6% said that they travelled less than 100kms a day. The drivers who travelled more were mostly those who run on shared basis because they always get passengers.



**Figure 313 Average length travelled by auto per day**

**d. Passengers travelled per day per auto**

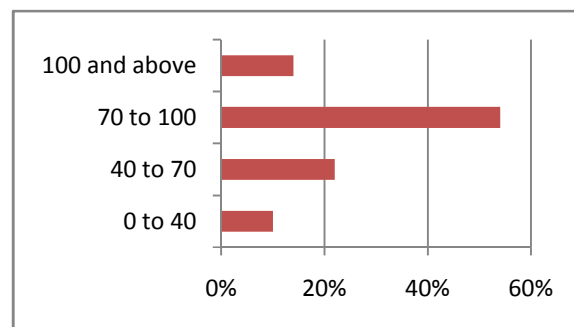
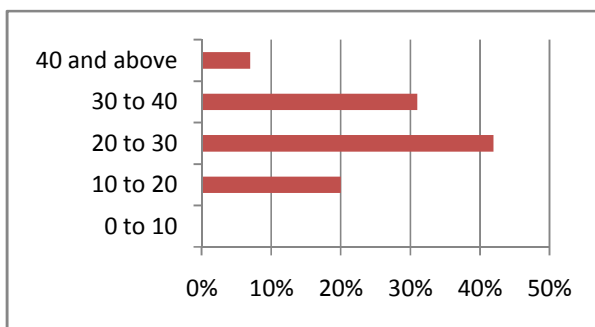
The passengers travelled per auto was higher when the auto was made to run on shared basis and it was less when the auto operated on private hire basis, but the revenue generated was similar.

42% of the privately run auto drivers said that about 20-30 passengers travelled in their auto and 31% said that they managed to acquire 30-40 passengers. 7% of them said that on few days they could manage more than 40 passengers but on off days they more could fall below 30.

The auto drivers running on shared basis said that about 32% of them carried about 40-70 passengers per day. 54% said that they carried about 70-100 passengers per day and 14% said that they carried more than 100 passengers per day. The distance travelled per day.

**e. Funding Provisions to operators**

During the survey drivers did not show much of an intent or desire to get loans from nationalized banks since the bank procedures are lengthy and time taking and during this period they loose on revenue. Thus the drivers feel that it is easy for them to get loans from



**Figure 315 Passenger travelled per day per auto on private hire basis**

**Figure 314 Passenger travelled per day per auto on shared basis**

private financiers even when their rate of interest is higher than that off nationalized banks. They auto drivers said that few government schemes like Swarnajyanti yojana, Prandhanmantri yojana help them to gain finance. The only reason why an auto driver is tempted to take private finance is that they get the money easily for buying the auto rickshaw and that too without much of legal paper work.



20% of the respondents showed inclination of financing by nationalized banks and 15% showed inclination towards the government schemes but 65% preferred private financing.

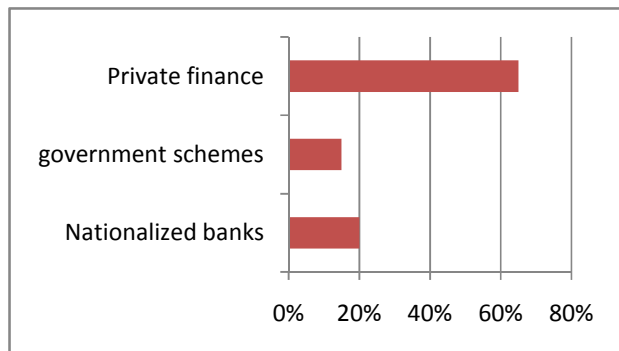


Figure 316 Funding provisions available

**f. Maintenance cost of vehicles.**

**2 Stroke Auto rickshaw**

About 35% of the auto drivers said that the monthly maintenance cost lied between Rs1000-Rs1500, 40% said that for them it lied between Rs1500-Rs2000 and for 25% of them said that their maintenance cost was more than Rs2000. These high figures could be because many of their vehicles were not in very good mechanical condition.

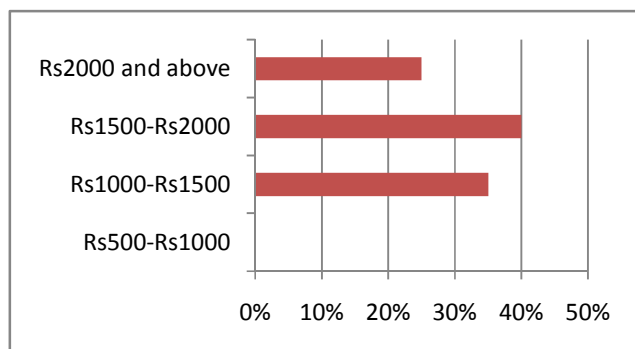


Figure 317 Maintenance cost of 2 stroke vehicles.

**4 stroke Auto rickshaw**

20% of the drivers said that they had to spend an amount between Rs1000-Rs1500 as maintenance cost whereas 60% said that they had to spend about Rs1500 to Rs2000. Only 20% of the drivers said that they had to spend more than Rs2000 to maintain their vehicle. These high amounts could be a result that the drivers have included the engine oil cost in

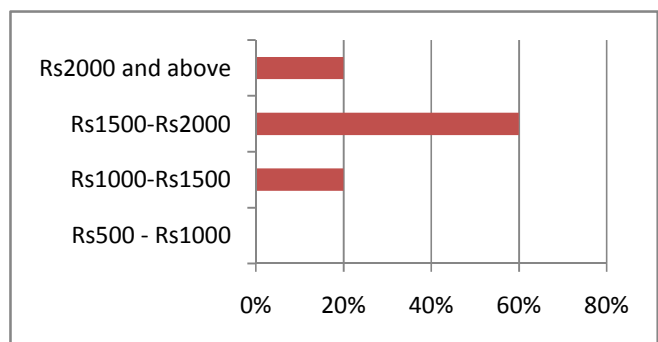


Figure 318 Maintenance cost of vehicles.

their maintenance cost also.

### g. Other charges/bribes/penalties

Fines and penalties are charged on auto drivers by the traffic police and RTO's mainly for overloading of passengers, vehicles without permit or documents, unauthorized parking, violation of traffic rules etc. About 27% of the autos are charged for overloading, 38% for incomplete documents, 12% for unauthorized parking and 23% were charged for violation of traffic rules.

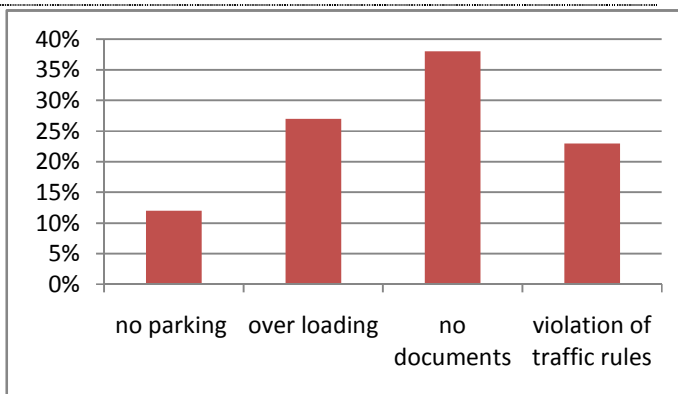


Figure 319 Reason for charge, penalties

### h. Association with unions

There are about 3 to 4 auto rickshaw union in the city registered under the Trade Union Act. The most influential of these is the Amritsar Auto Rickshaw Welfare Union headed by Ram Sharan Pal. The unions provide them benefits in official matters like renewal of permits, getting loans sanctioned for new vehicles and acts as a mediator in cases of disputes. The auto drivers are not very eager to join the unions since they do not provide them social benefits and are mainly organizing strikes during fare hike and other cases of disputes

Table 2:- Total income and expenditure of auto drivers

Descriptions			Total earnings per month (Rs)	Maintenance cost per month* (Rs)	Payment to police per month	Total expenditure per month (Rs)	Total Revenue per month (Rs)
Income in case of rented auto rickshaw	Private services		6000	1500		1500	4500
Income in case of owned	Private		16500	1500		1500	15000

<b>auto rickshaw</b>	services						
<b>Income in case of rented auto rickshaw running on profitable routes</b>	Private services		15000	1500		1500	13500
<b>Income in case of owned auto rickshaw running on profitable route routes</b>	Private services		25500	1500		1500	24000
<b>Income in case of rented auto rickshaw+advertisement revenue*+school permit</b>	Private service		6000+300+400	1500		1500	5200
<b>Income in case of owned auto rickshaw+advertisement revenue*+school permit</b>	Private services		16500+300+400	1500		1500	15700
<b>Income in case of rented auto rickshaw running on profitable routes+advertisement revenue*+school permit</b>	Private services	2 stroke	15000+300+400	1500		1500	14200
<b>Income in case of owned auto rickshaw running on profitable routes+advertisement revenue*+school permit</b>	Private service		25500+300+400	1500		1500	24700
<b>Income in case of rented auto rickshaw</b>	Private services		6000	1700		1700	4300
<b>Income in case of owned auto rickshaw</b>	Private services		16500	1700		1700	14800
<b>Income in case of rented auto rickshaw running on profitable routes</b>	Private services		15000	1700		1700	13300

<b>Income in case of owned auto rickshaw running on profitable route routes</b>	Private services	4stroke	25500	1700		1700	23800
<b>Income in case of rented auto rickshaw+advertisement revenue*+school permit</b>	Private service		6000+300+400	1700		1700	5000
<b>Income in case of owned auto rickshaw+advertisement revenue*+school permit</b>	Private services		16500+300+400	1700		1700	15500
<b>Income in case of rented auto rickshaw running on profitable routes+advertisement revenue*+school permit</b>	Private services		15000+300+400	1700		1700	14000
<b>Income in case of owned auto rickshaw running on profitable routes+advertisement revenue*+school permit</b>	Private service		25500+300+400	1700		1700	24500

\* Revenue through advertisement is taken as Rs300 per month

\*\* Revenue through school permit is taken through 400 per month

\*\*\*Maintenance charges for 2 stroke and 4 stroke vehicles is taken as Rs1500 and Rs1700 per month respectively

#### **i. Other problems**

- 
1. The total number of LPG pumps in the city is only 2 and are inadequate to cater to the large number of LPG IPT running in the city.
  2. The number of government authorized workshops in the city is inadequate.

3. No social benefits are given like training benefits, housing, medical facilities, and education facilities
4. The police officials and passengers do not give adequate respect to the auto drivers
5. There is no specific dropping and pick up points for the auto drivers near the golden temple creating a large chaos. There are also no dedicated parking areas for the IPT where they can wait for the passengers.
6. Auto's with number plate other than that of Amritsar are allowed to ply on roads using diesel as a fuel whereas auto's that are registered in Amritsar are not allowed to do so.
7. Cycle rickshaws are allowed to travel near the Golden temple and auto rickshaw are prohibited to do so, this decision was taken to reduce congestion but the congestion still remains. The present drop off point for IPT is 2km away from the golden temple complex

**j. Other suggestions like financing assistance, provision of infrastructures, Social benefits schemes**

In the driver survey, various suggestions given were given in order to in making their operations and socio-economic conditions better

**Infrastructure**

The drivers were asked to give an opinion on whether what infrastructure developments (such as provision of auto rickshaw stands, parking zones, auto rickshaw lanes, and terminals, provision of dial a rickshaw service)

would improve their operations. 45% rickshaw drivers

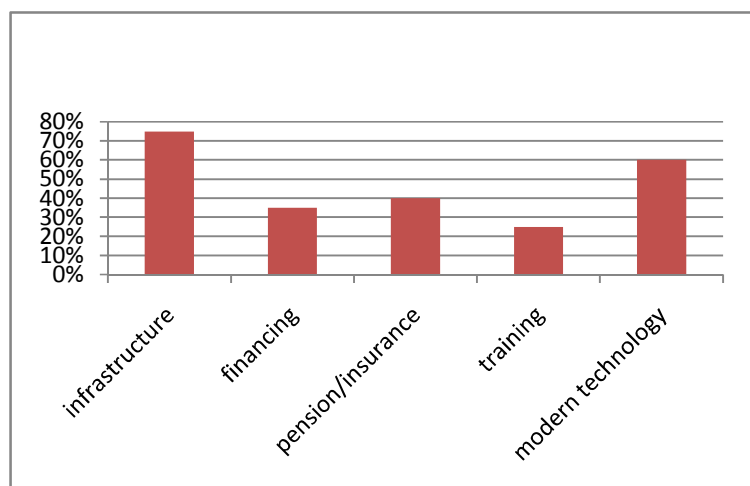


Figure 320 suggestions for improvements

wanted to get access again to all the major routes where the auto rickshaw is banned so that they can increase their revenue. 35% also wish that an initiative like that of Fazilka ecocabs starts in order to improve their efficiency and service delivery. 75% want the government to increase the number of LPG filling stations since only 2 stations present are unable to cater the huge number of LPG based auto's.

### **Financing**

The drivers wanted the government to come up with an easy financing solution benefiting both the government and the auto drivers since the auto drivers have to pay a huge amount in the form of rent to the vehicle owners. The drivers are willing to take loans from nationalized banks if the process of issuing money is made easy and less time taking. The drivers have to pay heavy rent to the owners of the rickshaw and this becomes difficult due to the fact the earnings of the drivers is not fixed. 35% of the drivers feel that it would be better if government comes up with beneficiary schemes that would make the rickshaw purchasing or interest payments at lower rates.

### **Pensions/Insurance**

About 40% of auto rickshaw driver feels that insurance should be given to them as they provide services to the general public.

### **Training Programmes:**

About 25% of respondents in Amritsar undergo training and educational training programmes for providing better service to customers.

### **Usage of modern technology**

The auto drivers of Amritsar believe that modern technology can help them improve their service delivery. 60% of the drivers want the government to come up with a dial a rickshaw service so that these drivers can be a part of it.

#### **k. Summary of Drivers survey**

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1. According to the minimum wage criteria of Punjab an auto driver shall earn a minimum of Rs8350 per month but the drivers running rented auto's earn considerably less.
2. It is also seen from the survey that maintenance cost is higher for four stroke engines (average Rs 1700 per month) as the spare parts are expensive and the drivers therefore prefer to buy local parts from the markets, leading to greater number of breakdowns and faults.
3. Lack of proper infrastructure facilities like auto stands, parking areas, workshops for repairs etc.
4. From the drivers survey it has been observed that getting loans from nationalised bank is a lengthy process. Also, many times the driver does not possess all the necessary documents like address proof, pan card details, ration card, previous loan repayment track record, guarantor etc required by the banks to finance the loan. Hence the driver feels it easy to resort to a private financier even though the financier charges higher interest at 20-25%. But since the earning is low therefore the drivers cannot repay back the loan and often the vehicles are taken away by the bank. So the drivers lose their source of income.
5. Since the educational levels are lower therefore computerized driving test are not possible to be given.
6. No training or personal benefits like education, house, medical facilities are given to drivers from the government side.
7. The drivers want to get access to the major routes from which they are banned after introduction of a bus system. They also want access to the areas near to Golden temple.

8. The driver's want the government to increase the number of LPG stations in the city has only got 2 LPG station and they spent a large amount of time waiting in a line to get LPG filled.

## Users survey

User survey was carried out to understand the demand side of the auto rickshaw service. A survey of 100 users on the basis of random sampling was carried out, at various locations. By selecting various characteristics that they associate with this IPT.

### a. Age group of users

From the survey it has been observed that all age groups of people use the IPT services. About 67% of the surveyed users belong to the age group 20 to 40 years. Only 20 % belongs to the age group between 40- 50 years. Above the age group of 50, only 5 % uses the service. Therefore the IPT services are mostly used by the working population. Only 8% of the respondents were found to be of age less than 20 years.

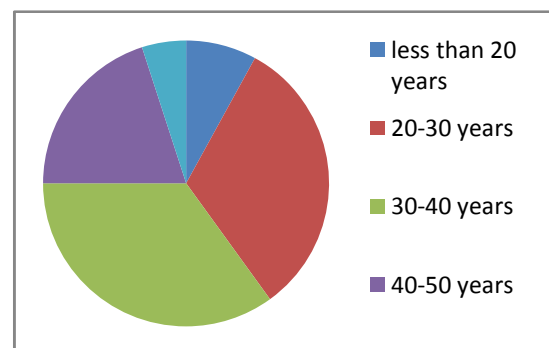


Figure 321 Age group of respondents

### b. Occupations of users

From the survey it is observed that about 25% of the users belong to the private firms. About 10 % of the government uses IPT services, students account for 25% and 3% to housewives.

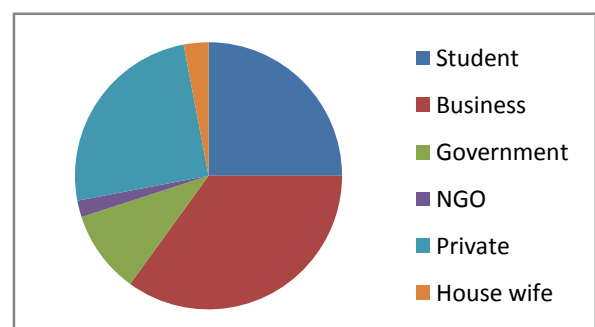


Figure 322 Occupation of respondents



**c. Average distance travelled by passengers**

It was observed that about 80% of the passengers in the city use IPT for travelling distances not ranging up to 10km. 12% of the respondents generally travel for distances ranging from 10-20 km and 8% of the population used to travel a distance more than that of 15km.

The average distance travelled has significantly reduced after a bus service was introduced in the city and the autos were banned on the major roads of the city.

**d. Average expenditure per month**

From the survey it has been observed that about 75 % of users spend monthly of not more than Rs 1000 for using IPT services. However on 25% spends more than Rs 1000, as these passengers travel more distance and do not prefer shared auto services.

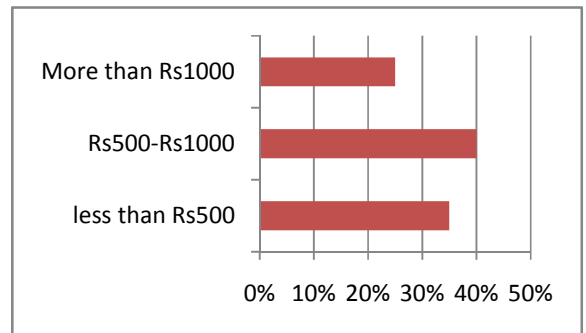


Figure 323 Average expenditure per month

**e. Safety and Security**

It has been stated that 75% of the users said that there is no safety and security mechanism systems in the IPT vehicles and the crime rate is therefore higher. But another 25% of people are of the opinion that autos are safe modes of travel.

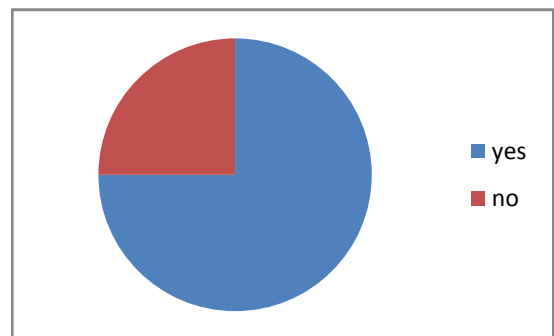


Figure 324 :- Safety

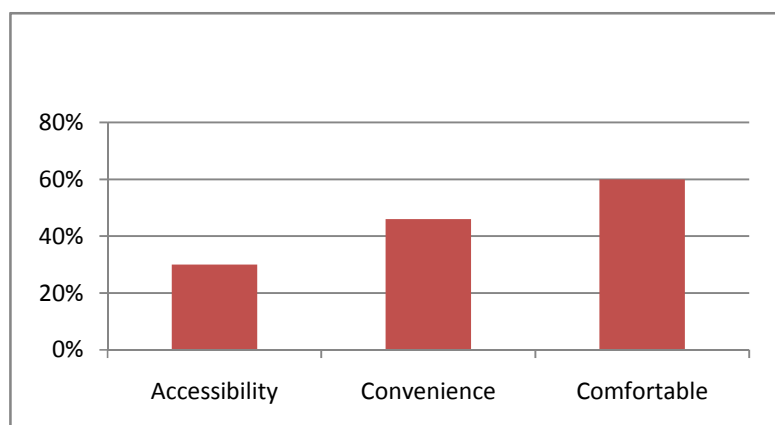
**f. Reasons for usage of IPT other than Public transport**

This criteria was mainly aimed to know why the passenger use auto rickshaw as a mode to travel in preference to Public Transport mode. For the purpose, the passengers were asked to

associate parameters related to their preference for auto rickshaw. The following are the characteristics associated for the usage of IPT.

1. **Accessibility:** Nearly 70% respondents found IPT are not accessible as the users have to come to the main street as there is no door to door service available. About 150 auto rickshaw move throughout the city during the nights but they are not very accessible. Thus the respondents wanted this number to grow.
2. **Convenience:** Another characteristic associated with their preference was convenience. Around 46% respondents find IPT to be more convenient again for the main reason being its easy availability. Also the waiting time for these IPT are generally lower compared to the public transport therefore the overall journey becomes very convenient.

g. **Comfortable:** Comfort was one of the important criteria that people associated with their preference for IPT. Guaranteed seat, less congestion as compared to



bus and easy availability and connectivity are main

Figure 325 Reasons for using IPT

characteristics for comfort associated with the auto rickshaw. 60 % of the respondents using shared auto in Amritsar said that it is not very comfortable to travel in a shared rickshaw as the driver overloads the rickshaws.

**g. Other Suggestions for organizing services of IPT**

1. Usage of modern technology- About 55% of users suggested the usage of modern technology like providing of GPS metered electronic fare system so that drivers do not charge illegally.

2. When users were made aware of the usage of old panic button, dial a rickshaw services then about 70% passengers are willing to use the services. The other 30% believes that there will be extra transaction charges associated with the modern technology used, as a result people would not prefer to use the services.

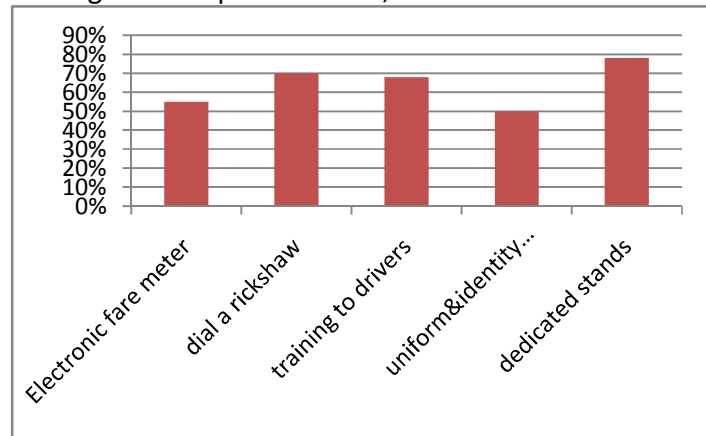


Figure 326 Other suggestions for improving IPT

3. Training to drivers on road safety and driving skills were also agreed by about 68 % of the users. As the drivers often drive rashly according to passenger's perception.
4. 78 % users agreed to fixing dedicated parking and stands for IPT to remove the chaos and congestion on busy roads.
5. About 50 % of users agreed that uniform dress code and identity card to all drivers make it safe for users using the service as lot of crime takes place in the city.

#### h. Summary of findings from Users survey

1. The driver's behavior with the passengers is not satisfactory and they charge them higher fares.
2. The autos are allowed to carry only 3 passengers but they carry 6 to 7 passengers which leads to the discomfort for the passengers.
3. The accessibility of autos in the night from 11pm to 5am is poor and shall improve.
4. Due to absence of dedicated auto rickshaw stands and parking areas often there is found chaos and congestion on roads

5. Safety and security mechanisms are missing therefore the users especially females do not feel safe to use the services after evening.
6. A large number of users want a helpline number be made available to them so that they can register their complaints against drivers not moving on meters