The impact of taxi zoning on transportation system in Nagpur city

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ABSTRACT

A taxi zoning system was for the first time introduced by the Derg region about 20 years ago. The Nagpur taxi transport service, which is believed to have begun from 2012 to 2016 with small cars has gone through various stages and systems before it reached the current level. The authorities of transport confirmed many times in the past that, the existing public transport system in Nagpur is critically inadequate to provide services for the existing travel demand. The overall performance of mass transport was constrained by many problems such as low transport service accessibility and standard, lack of taxi station, parking spaces and poor traffic management and control have remained the most critical issues to day. The need for adequate transport services has been kept on growing. This study investigates the reason which assesses the need to zone the taxi service in Nagpur city and the impact will result from the zoning in service delivery in the city. Structured questionnaire and survey interview have been prepared and targeted to three categories, control staff which includes a transport agency, traffic police, and taxi association. The second category includes taxi drivers, terminal attendants, and third category include service users or passengers that use a taxi as the main mode in the southwest zone. The descriptive and exploratory research methods, quantitative research methods are employed to study the information gained from the structured questionnaire and interview questions. The collected data were classified, organized, and interpreted by using descriptive statistics including tables, frequency distributions, and percentages to give a digested picture of the data. The analysis of the data showed that taxi zoning transport service in Nagpur city may fail to achieve its purpose as stakeholders do not have any training concerning to system, there is a problem of implementation and it is also noted that 65 percent of mode share for two-wheelers contribute in the city, population is expected to grow annually by 3.8 percent, taxi drivers gain much more extra income when they cut trips, especially during rush hours, about 66.6 percent of respondents replied that they could not find taxi easily and most of the respondents say that inside facilities of taxi are not comfortable for customers. This study will help the taxi service industry to develop and design their future market strategy.

Keywords— *Taxi zoning, Taxi service, Consumer satisfaction level, Taxi service*

1. INTRODUCTION

Civilized life confides on transport for goods evolution, the movement of people for activities such as jobs, edification, purchasing and leisure activities. A good transport system plays a crucial role in the development of the country, affecting the means in which its transport system progress. The overall development of the country ensures that the transportation system develops in the way which is most conductive, can have far reaching benefits and contrarily, foible in doing so will have a ruinous effect on development. In developing countries, as compared to car ownerships, the population is increasing at a much faster rate, and thus the population is reliant on public transport other than very short travels and journeys. In developing countries, families are considerably big and even if there is a car or own vehicle in their household, most of the family members prefer public transport for travel and journeys for atleast some of the reasons. Therefore without any access to the private sector of transport, public transportation system plays a crucial role for the endless majority in developing countries. People with employment opportunities should have their own mobility but people having lower levels of income, poor circumstances for them affordability is a frequent problem and aid implemented to them are generally witnessed as inadequate. (Lines 2004). According to Darido (2007) mobility in the developing world is often characterized by travel demand which usually exceeds supply by a greater extent. The city of Nagpur is not an exception to this reality. According to Jacobs (1986) stipulation in urban public transportation services in developing cities is rising in the same way as in other world cities. Public transportation is an important element in day-to-day activities in any city because of the following reasons:

(a) Relatively affordable means of transportation
(b) Insufficient infrastructure to promote private vehicle ownership
(c) Environmental pollution and traffic accidents are reduced

Even though the role of public transportation is crucial, the service provider is not good enough since demand is much greater and

increasing than the supply. With an increase in population (number of passengers) service should be expected to grow which is not practically true in the cities due to financial and managerial constraints. According to Mintesnot et.al. (2007) despite prevailing problems, efforts to make an empirical study of transportation in the city are insignificant.

A taxi zoning system was for the first time introduced by the Derg region about 20 years ago. In Nagpur, the taxi transport service triggered by 2012-2016 with small cabs is under processed through enormous stages and systems since it attained the current level. In Nagpur City, Bus Service evoked 60 years back in order to provide transport services to the public. This service has widely covered areas, in and around the Nagpur city but it is deficient and it masks a lot of defiance in providing requisite services. Besides in terms of consumer satisfaction, it is unproductive. With a glance to these inadequate services, the state government has acquainted minibuses transport service having 25 passenger's seating capacity with influencing private investors to engage in the transportation sector for the public. According to Eshetie et. al (2013) the long run interventions namely the long distances buses, MRTS, BRTS cannot pseudo bus services, and with proper scheduling and proper utilization, the addressed problem of congestion can be taken over with respect to the expansion of lanes and buses in the city. Taxi zoning service program was reintroduced by many Transport bureau in 2008. However, the plan was not implemented in Nagpur to date. The main function of Zoning is to construct an impartial service in all areas, inhibit taxi operators from branching long routes to make extra money and facilitate passengers to bacon the appropriate fees. As per the system number of routes are to be categorized into at least five zones. Vehicles have to register by the transport bureau to employ the system and also needed to identify some Taxi Owners Associations as stakeholders in the zoning system. Nagpur Transport Branch Office needs to start taxi zoning transport system to improve the urban transport situation.

According to the new taxi zoning rules following are the expectations:
(a) All registered taxis are expected to list their fares based on travel distance.
(b) Operation time will be from 6:30 am to 9 pm in all zoning areas.

Registered taxis are classified based on their registration date, owners or drivers name, license plate number, the year the car was manufactured and the number of years that it has provided service.

2. LITERATURE REVIEW
In many developing countries, the accouterment of public transport has become a dominant obstacle now days due to accelerated urban population growth leading to increased demand. Due to the shallow level of income, uncontrived operation of private transport, bottleneck congestion, incompetent infrastructure, as these are compassed these make the existing transport system inadequate to handle. The expansion of owned vehicle is also having an effect with the decentralization of day to day activities along with dispersed development of residential areas.

Migration of population from rural to urban areas increases the rate of growth of urban population in most of the developing countries. As compared to national population the urban population is booming at a much rapid rate in many of the developing countries. The main reason for the rise in GDP is aiming from the increased volume of movements of population growth and expanding mobility. According to Darido (2007) mobility in the developing world is often characterized by travel demand which usually exceeds supply by a greater extent. The city of Nagpur is not an exception to this reality. According to Jacobs (1986) stipulation in urban public transportation services in developing cities is rising in the same way as in other world cities.

According to Johnson (1970) transportation represents the world business activities dealing with travel, traffic and communicating or with the movement of persons and things and with the mechanical transmission of ideas. Eshetie, Birhanu and Daniel (2013) conducted studies and predicted city transport in various countries is very poor. Their studies were focused on bus transport rather than a taxi. There are very few studies Wondemu (2012) conducted on public transport in an urban area and the finding indicates taxi transport service is bad. Availability of transport refers to route possibilities and timings along with frequency in connection to the purpose of an individual journey for education or work or leisure or personal services or other provided that it has to be constrained by the route and the time is taken travelling. Accessibility depicts the gratification with which all division of consumers can operate public transport. Lack of adequate transport facilities characterized most of the Indian cities. According to Amford et.al. (1978) even today in the transport map of many countries the large areas are still not facilitated still with modern transport links.

3. PROBLEM ARTICULATION
The authorities of transport confirmed many times in past that, the existing public transport system in Nagpur is critically inadequate to provide services for the existing travel demand. The overall performance of mass transport was constrained by many problems such as low transport service accessibility and standard, lack of taxi station, parking spaces and poor traffic management and control have remained the most critical issues today.

Besides, most of the roads are poor and the quality and accessibility of the taxi are discouraging, increasing traffic congestion, pollution and accidents in the city. Despite the magnificent effort, taxi transport service remains the main problem in Nagpur and the need for adequate transport service has kept on growing. That is inefficient even if a mechanism like zonal taxi transport system was introduced by the government; the problem could not be resolved due to the interplay of multiple constraining factors.

According to the Nagpur Roads and Transport Bureau over 200 taxi routes have been identified in five zones of the city. The Taxi service associations established would be operating in a specified zone. The taxis will display pointers indicating starting points, passageways and destinations. They will also put on view the distance of the route and the corresponding tariff. According to the transport head office, the new scheme is rewarding to taxi owners and drivers, as well as to car and parking attendants. It will also help to create sound relations between the service providers and their customers.

4. OBJECTIVES
(a) To explain the rationale for zoning the taxi service in Nagpur by the city administration by taking Nagpur as a case.
(b) To assess the position of customers and drivers about zoning the taxi services.
(c) To evaluate the level of satisfaction of taxi service users emanating from the taxi service zoning.

5. METHODOLOGY
The main purpose of this work is to investigate the reason which will assess the need to zone the taxi services in Nagpur and the impact that will result from the zoning in service delivery in the city. The target groups of this study are categorized in to three, the control staff which includes a transport agency, traffic police and taxi association. The second category was the service provider which consist of taxi drivers, terminal attendant. And the third group was service users or passengers that use a taxi as the main mode of transport in South-West zone.

The collected data were classified, organized, and interpreted by using descriptive statistics including tables, frequency distributions and percentages to give a digested picture of the data. In addition, the information generated from key informants, interview and observation is analyzed using descriptive statistics using Microsoft Excel.

The quantitative research methodology was employed as a supplementary to the study with the information gained from a structured interview made with transport bureau, taxi association, taxi drivers, terminal attendant and customers. From the available taxi associations in the study are two taxi associations were selected purposively. According to the information obtained from the selected associations, there were 16 taxi routes which consisted of 550 taxis during the study period. Out of these 5 of the taxi routes containing a total of 123 taxis were selected using systematic random samplings. As a result, 123 taxi drivers and the numbers of customers are not known, on spot questionnaire far some many days at different point of time select about 123 were selected convince.

Since the transport agency, taxi association and traffic police are responsible for the implementation and control of the zonal taxi transport system, 2 people from transport bureau, 2 people from taxi associations, 1traffic police and 8 terminal attendants were selected purposively.

Table 1: Population Sample Size

S no.	Types of Respondents	Total Population	Sample Size	Sampling Type
1.	Transport office	NN	2	Intentionally
2.	Taxi associations	12	2	Intentionally
3.	Customers	NN	123	Convince
4.	Taxi drivers	990	123	As per Availability
5.	Terminal attendants	NN	8	As per Availability

The sources of the data in this research are both primary and secondary source of data. Primary data collects through a questionnaire, Standardized structured interview with the special person, personal experience and observation. Secondary data was collected from documents available, internet, reports and opinions.

The questionnaire contains three different characters for collecting the necessary information related to taxi zoning. The first part includes sex, work hours, occupation, household size, monthly income, the average daily cost of transport in order to analyze the affordability of samples and socio-economic status. The second part of the questionnaire includes the travel behavior of the subjects, the design data used for this part include, mode of public transport users, the purpose of travel, the average number of trips per day, origin and destination of trip and time of travel. With the help of this data, people were able to see demand patterns of public transport.

6. RESPONDENTS CHARACTERISTICS
The respondents were asked to indicate their background information. The details of the characteristics of the respondents are given in the table below.

Table 2: Characteristics of the respondents

S no.	Particular		Frequency	%
1.	Sex	Male	120	89
		Female	15	11
2.	Marital status	Married	85	63
		Unmarried	50	37
3.	Family size	1	35	32
		02 to 04	35	32
		5	20	18
		07 to 10	20	18
4.	Educational level	01-Oct	10	7.4
		10+2	15	11
		Diploma	15	11
		Degree	80	59
		MA	15	11
5.	Occupation	Student	15	11
		Government Employee	100	74
		Self-Employee	20	15

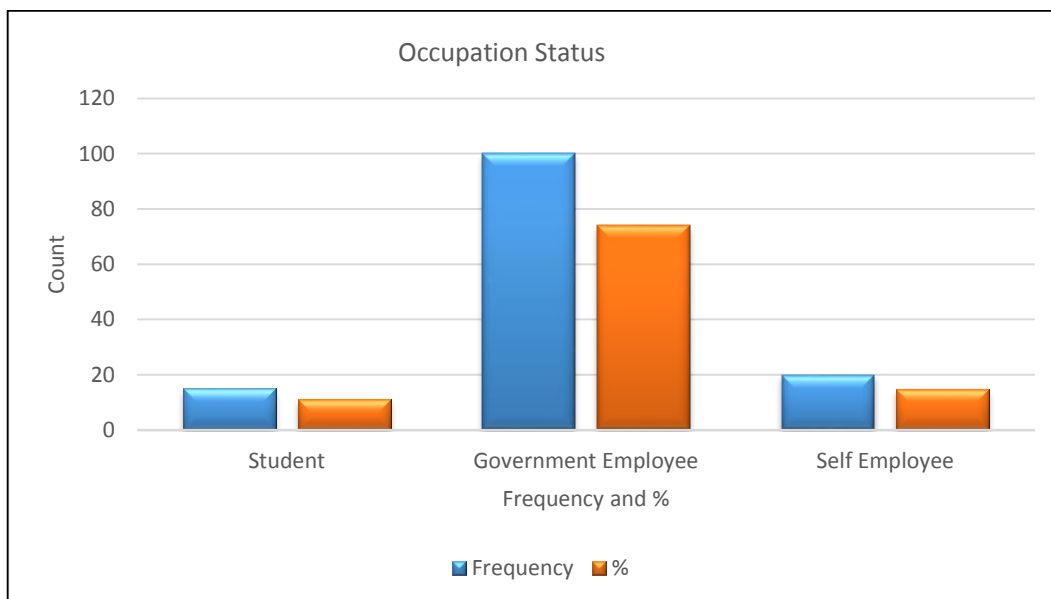| 6. | Income (Rs.) | 5000-19000 | 25 | 19 |
		20000-24000	55	41
		25000-50000	20	15
		Unknown	35	26
7.	Working hours	1:00	4	3.3
		2:00	35	29
		0.29167	71	59
		Night worker	10	8.3
		9:00	15	14
		9:30-10:00	20	19
		10:30-11:30	66	62
		12:00-1:30	5	4.7

6.1 Occupation status

Fig. 1: Occupation status

Regarding the occupation level of the customers, 74.1% of them are government employee, 14.8% were self-employed and the remaining 11.1% are students
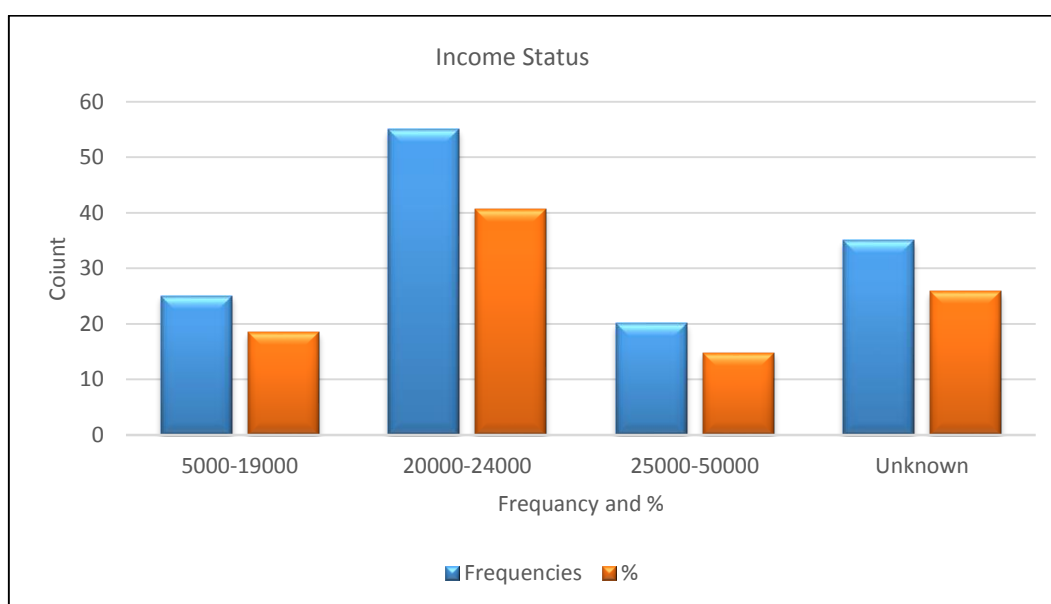
6.2 Income status

Fig. 2: Income status

As shown in table about (40.7%) of the respondents earn 20000-22000 Rs. monthly. 25(18.5%) of them earn 500-1900 Rs. monthly and those who earn 2500-5000 Rs. are 20(14.8%) and customers whose income unknown are 35(25.9 %.)This implies that those people who earn relatively high-income use taxi transportation compared to low income earning people in the study.

6.3 Willingness to Pay to Owner

Fig. 3: Willingness to Pay to Owner

The drivers were asked how much money they were expected to give the owner 81 (73%) drivers give from 400-500, 15(13.5%) give from 200-300 and 15(13.5%) drivers give 150 to 180.

Table 3: Structured Questionnaire and Respondents Response

S no.	Items	Responses							
		Agree		Disagree		Uncertain		Total	
		NO	%	NO	%	NO	%	NO	%
1	I can find a taxi where ever and whenever I need.	28	29.6	90	66.6	5	3.7	123	100
2	Taxi service accessibility is satisfactory even in peak	18	14.8	95	77.7	10	7.4	123	100
3	There is no time waste by waiting taxi.	38	29.6	75	63	10	7.4	123	100
4	I am not late at work because of taxi.	47	36.6	60	52.2	15	11.2	123	100
5	There is no traffic Congestion	28	22.2	85	70	10	7.4	123	100

The respondents were asked if they could find a taxi wherever and whenever they needed. About 90(66.6%) of the respondents replied that they couldn't find a taxi easily. The rest, 40(29.6%) of them responded that it was possible for them to get a taxi easily and 5(3.7%) customers are uncertain about it. This implies that the taxi availability and accessibility are questionable. Besides, the zonal taxi distribution is not totally efficient.

Table 4: Passengers responses on Acceptability and Affordability of Taxi Transport

| S no.	Items	Responses							
		Agree		Disagree		Uncertain		Total	
		NO	%	NO	%	NO	%	NO	%
1	Everything inside the taxi is comfortable.	30	22.2	78	66.7	15	11.5	123	100
2	Quality of road is satisfactory and sufficient.	40	33.3	58	48.1	25	18.5	123	100
3	I did not see anybody fight with the taxi assistants because of in appropriate	20	14.8	83	70.4	20	14.8	123	100
4	Zoning system make me more satisfy on taxi service.	25	18.5	83	70.4	15	11.1	123	100
5	The construction of road and railway make taxi	88	74.1	15	11.1	20	14.8	123	100
6	A zoning system is good but stakeholders are not fulfilling their responsibility.	55	45.2	48	40.1	20	14.8	123	100
7	Population increase is one of the causes to make taxi	88	74.1	25	18.5	10	7.4	123	100
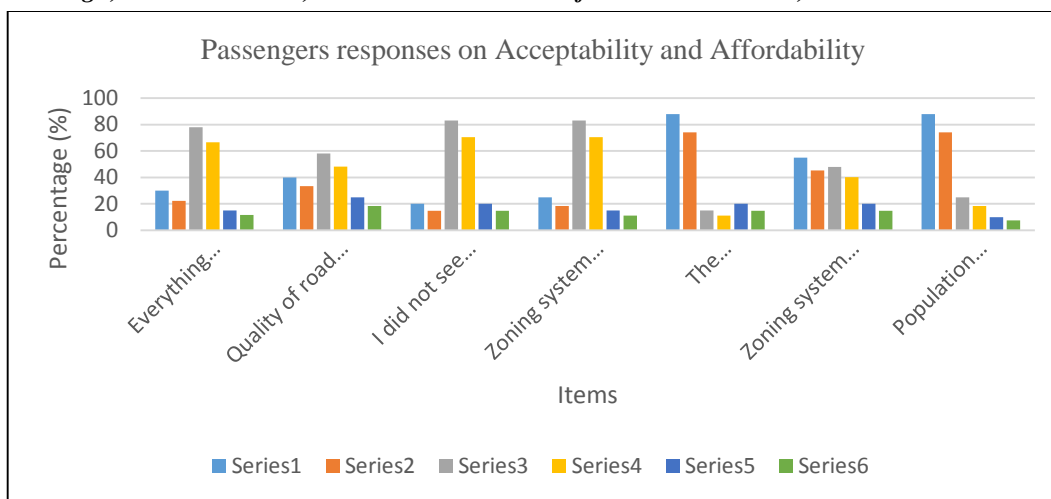
Fig. 4: Passengers responses on Acceptability and Affordability

The majority of the respondents, 90(66.6%) responded by saying that the inside facilities of taxi are not comfortable for the customers, 30(22.2%) of them said that the facilities are somehow good. The rest, 15(11.5%), of the respondents, replied they are not certain about the issue under study. This shows that many of the customers are not satisfied with the seating facilities of the taxi.

7. RESULT
The main positive change of zoning system will be the emergence of new routes and somehow establishes direct travel from origin to destination. The majority of users said that taxi availability and accessibility is very difficult. They also confirmed that taxi affordability and acceptability was not good in the zone. The majority of the respondents alleged that corruption, concentration in a single place and carelessness were the main problems observed around the traffic police. The analysis of data showed that taxi zoning transport service in Nagpur City fails to achieve its purposes. As far as the level of satisfaction of taxi users is concerned, starting from the absence of waiting facilities, taxi facilities, inappropriate manner of taxi drivers and assistants, shortage of taxi services, forced to pay more than the tariff are observed in the zone. Hence, taxi acceptability, affordability, accessibility and availability of taxi transport in the zone under study are not found to be good.

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