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RESEARCH ARTICLE

PARKING PROBLEMS IN INDIA – MEASURING THE MONETARY LOSS.

Mr.Jovit Manjaly[1] and Dr.Sebastian Tharapil Joseph[2].

1. Ph.d Scholar Department of Business Studies, JSBS Sam Higginbottom University of Agriculture Technology & Sciences.
2. Assistant Professor (Sr.) Department of Business Studies, JSBS Sam Higginbottom University of Agriculture Technology & Sciences.

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Abstract

Introduction:-

India, the second most populated country in the world, houses more than 40 million vehicles, is the only country which saw a growing car sales even during the recession and recorded the highest sales volume during 2009 and 2010. India has a strong domestic market, and this growth is expected to sustain and increase over the next few years, given that India's car per capita ratio is currently among the lowest in the world's top 10 auto markets.

All the cities in India face severe parking problems. Though parking has negligible effect on quality of transport but there is damage to the life of engine due to parking. Due to anonymous increase of traffic in India, parking has become the new problem along with pollution and poor quality roads. There are two types of parking's, they are off street parking and the other is on street parking. Off street parking is common in big shopping malls and theatres and huge offices which are used by employees & customers, on the other hand on street parking is traffic problem causing as the parking is directly controlled by market forces, with individual parking and hence has high demand and is considered as public property. Some might argue that parking is one of the lesser woes of urban transport, but this view has led to its exclusion from the policy frame work, causing much traffic. This results in poor quality urban transport, misuse of land and increasing social and environmental costs.

All the urban areas in India face serious parking issues. Despite the fact that parking has irrelevant impact on nature of transport yet there is harm to the life of motor because of parking. Because of unknown increment of activity in India, parking has turned into the new issue alongside pollution and low quality streets. Presently –a – days parking - issue is identified with space so we ought to minimize the space to decline the parking issues due absence of parking there will be an issue of fuel misfortune and low air quality or clogging. So in a few urban areas, pay for the utilization of parking is additionally been presented in occupied markets as this the expense of the area is discounted and there will be control of interest and keeping the business sector from misshaped. The foundations for parking lack are because of few doubts, for example- Parking is open property and fleeting answers for long haul issues that is by taking impermanent activities.

Mending the ways to solve this issue, some points to work on can be seen as - Expanding the parking spaces so more vehicles can be stopped and improving openness and passerby ways around parking spaces to make it more advantageous to stroll from parking space to the objective. This diminishes the drawback of parking in a space that may not be near the fancied area.

Corresponding Author:-Mr.Jovit Manjaly.
Address:-Ph.d Scholar Department of Business Studies, JSBS Sam Higginbottom University of Agriculture Technology & Sciences.

Most extreme use of accessible space so, we can spare the extra burden on parking administration. It is possible by more use of open transportation than private transportation as it involves both expense and financial. Charge drivers straight forwardly for utilizing parking space when not required. This will encourage quick recuperation of expense and will likewise go about as an instrument of interest administration. The parking spaces in business regions ought to be valued higher to guarantee the space of need clients and customers of the specific quit/building.

Current Scenario in India

Now –a – days parking problem is related to space so we should minimize the space to decrease the parking problems due lack of parking there will be a problem of fuel loss and low air quality or congestion. So in some cities, pay for the usage of parking is also been introduced in busy markets as this the cost of the land is refunded and there will be control of demand and preventing the market from distorted. For its maintenance where the cost is not so high and no free, researches are being done to reduce the area. Fundamentally parking is a problem of space. With the growing culture of automobile dependency in Indian cities, the demand for parking spaces are sky rocketed. This is especially because the infrastructural growth of our cities is unable to keep up with the growing demand for spaces to park. The resultant scarcity of parking space has begun to spill over to other aspects of urban life in form of congestion, fuel loss, dispersed land use and low air quality. So as long as there is inexpensive provision for parking, there will be an increase in usage of private vehicles, further abetting the problem. Therefore, it is imperative to arrive at a solution that on one hand provides space for parking while simultaneously managing demand for parking on the other.

On a normal working day, 40 per cent of the road space in any average-sized Indian city is used for parking rather than for movement of traffic. With every middle class family affording a car, the number of four-wheelers being added to the vehicular population is simply shooting through the roof. Going by the trend, no amount of space will be sufficient to accommodate stationary vehicles, thereby squeezing the movement of public transport to narrower lanes.

Objective of the study:

1. To find out the problems, causes and effects of non-parking Indians.
2. To find out how proper parking system contributes to the development of India.
3. To find out the present scenario of government parking system and loss to them in absence of proper parking.

Review Of Litrature

(Agarwal, 2006) studies in the study which was carried out for the Ministry of Urban Development, covering 21 cities in the country, suggests that more than 75 per cent of the trips in a city are on account of either employment or education. Per capita trip rates range from 0.72 to 1.79 per day (RITES 1998). Over 30 per cent of the total trips are undertaken by walking and the share tends to reduce as city size grows and the share of trips by public transport goes up significantly as city size goes up.

(Nandekar & Raut, 2012) studied the modern sophisticated parking system with space management based on IR and Ultrasonic sensor network. In this system shortest path of the slot can be monitored, system helps us to prevent the vehicle from theft also used to model the space of the slot as per the width of the vehicle. This system is centrally controlled by WSN and Microcontroller and the display shows that availability of slot as per the width as well as the payment of the parked vehicle at the entry. This system is very effectively useful as compared to the existing parking system because it uses to minimize the time consumed for finding the nearest available space,

(Kolhar, 2012) studies about problems with current parking practices with the parking accumulation and supply survey in Dharwad.WTP survey was conducted to know the willingness of the potential user's appropriate parking fee for the new services. Specific parking management strategies (short term, medium term and long term) and the way they can be implemented are discussed.

(Simons & Lelekis, 2013) revealed in their study Parking Strategy: a coming of age, trying to balance the parking and travel demand needs (wants) of the community. While businesses and the community continue to want convenient and low cost parking, the increasing growth of Darwin as a vibrant city center, and pressure to operate existing Council car parks in a commercial (competitive) environment, demanded a holistic review of the Darwin CBD Parking Strategy.

(Simićević, Vukanović, & Milosavljević, 2013)studies in the paper, based on stated preference data and using a logistic regression, a model to predict the effects of introducing or changing the parking price and time limitation was developed. The results show that parking prices affect car usage, while time limitations determine the type of parking used (on-street or off-street). A positive finding for policy makers is that users with work are more sensitive to parking measures than are other users, so parking measures can be used to manage user categories. Although there is a concern that parking policy can jeopardize the attractiveness and efficiency of a zone, the results show that a very small number of users would give up travelling into the zone.

(Litman, 2013) in his report summarizes the book, Parking Management Best Practices (Planners Press, 2006), which describes and evaluates more than two-dozen such strategies. It investigates problems with current parking planning practices, discusses the costs of parking facilities and the savings that can result from improved management, describes specific parking management strategies and how they can be implemented, discusses parking management planning and evaluation, and describes how to develop the optimal parking management program in a particular situation. Cost-effective parking management programs can usually reduce parking requirements by 20-40% compared with conventional planning requirements, providing many economic, social and environmental benefits.

(Dawra & Kulshreshtha, 2017) studies about the issues the Indian cities are facing due to ongoing growth of parking demands and the best possible solutions that can be placed in context of it. The current approach of increasing the number of parking lots and reduction in parking rates to keep up with the rising demand doesn't solve the problem completely.

(Kotb, Shen, Zhu, & Huang, 2016) introduced a new smart parking system that is based on intelligent resource allocation, reservation, and pricing. The proposed system solves the current parking problems by offering guaranteed parking reservations with the lowest possible cost and searching time for drivers and the highest revenue and resource utilization for parking managers. Newfair pricing policies are also proposed that can be implemented in practice.

(Alkheder, Al Rajab, & Alzoubi, 2016) aimed towards the reduced applicability of paid parking system inside the city, named MAWAQIF at ABU DHABI. This article concentrates on this direction and focuses on two aspects firstly survey and then preparing a technical framework or developing an intelligent mobile application for improving the indoor parking management system in Abu Dhabi was developed. Results indicate that the proposed mobile application will help in reducing the time wasted in searching for parking and will increase the efficiency of the parking system in Abu Dhabi.

(Chen, 2017) suggested to establish emergency linkage mechanism between large parking lot, parking information, timely integration of related scientific allocation and scheduling parking space, through the Internet, radio, mobile communication and information display area parking release parking space and parking guidance information, where there is a parking space, where prices are lower, the owner may at any time the query, thus reducing the invalid traffic vehicles by looking for parking Spaces, improve the utilization rate of parking Spaces to reduce the difficulty of parking, reduce the resulting congestion and illegal, in order to make full use of existing resources of urban parking.

Research methodology:-

Area of reasearch

The research was conducted in the area related to parking problems in India and their solution. The whole study describes major and minor problems of non-parking Indians. It also focuses on the various rules and regulations of the parking, and how it generates income through proper parking system, also highlights the general public on the most traffic areas of Allahabad.

Type Of Reserch

The topic for the research is to study the nature of the non-parking Indians. The nature of the study is the theoretical and descriptive. So the conduct of the research study the type of research is suitable for descriptive research only. The data are collected from websites, journals, research paper, surveys, questionnaire etc. the descriptive research has met the requirements of research study.

Sample size:
the data is being conducted from the 250 respondents.

Sampling techniques:
In this study, the population is infinite in nature So, Sampling has been done through Random Sampling.

Research area: Allahabad
Data collection methods:
For the study purpose both primary and secondary data are used. The primary data collected through survey and observation and also the questionnaire. The secondary data collected from records, website, journals, published papers. The primary and secondary data have been collected to cover every aspects of the study. These data used in combination as per the need of the study.

Data obtained from all the parking survey analyzed in term of computation of various parking characteristics. Study of available reports, plans, survey data and statistics related to parking problems were identified, compiled and reviewed. The parking rules and regulation and practices were studied. In addition, many public servants were contacted for collection of secondary data.

Research Tools
For the collection of data following tools have been used
1. Questionnaire: the primary data is collected from structured questionnaire through interview and the question will be prepared considering the various class of respondents.
2. Observation: by locally observing the problems related to parking problem in local area.
3. Internet

Section I. Personal Information
Demographic profile of respondents
Table 1.1:-Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Service**	27	8.0	8.0	8.0
	Businessman	16	4.7	4.7	12.7
	Professional	33	9.7	9.7	22.4
	Retired	28	8.3	8.3	30.7
	Student	235	69.3	69.3	100.0
	Total	339	100.0	100.0	

The above table 1.1 shows that 69.32% majority of the respondents are students. While, professional, retired and service are 9.7%, 8.7% and 8.0 respectively. 4.7% of respondents are businessman.

Table 1.2:-Gender

Gender					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Male**	190	56.0	56.0	56.0
	Female	149	44.0	44.0	100.0
	Total	339	100.0	100.0	

The above table 1.2 shows that majority of the study comprised on females with 56% and males are 44%.

Table 1.3:-Education

Education					
		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**High-School**	56	16.5	16.5	16.5
	Intermediate	17	5.0	5.0	21.5

	Graduate	146	43.1	43.1	64.6
	Post-Graduate	118	34.8	34.8	99.4
	Total	339	100.0	100.0	

The above table 1.3 indicates that 43% respondents are graduates, 34.8% are post-graduates respondents and 16.5 respondents are upto high school and rest 5.0% respondents are intermidiate.

Table 1.4:-Age

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**18-25**	187	55.2	55.2	55.2
	26-35	73	21.5	21.5	76.7
	36-45	42	12.4	12.4	89.1
	Above 45	37	10.9	10.9	100.0
	Total	339	100.0	100.0	

The above table 1.4 indicates that the 55.2% of respondents are in the age group of 18-25 years, 21.5% of the respondents are in the age group of 26-35 years, the age group between 36-45 are 12.4% and 10.9% of respondents are above 45 years.

Section II General Information

Table 2.1:-Is this your property?

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Home**	51	51.0	51.0	51.0
	Business	13	13.0	13.0	64.0
	Other	23	23.0	23.0	87.0
	Both	13	13.0	13.0	100.0
	Total	100	100.0	100.0	

The above table 2.1 shows that the 51% of the respondents have their home, 13% of the respondents are having business and home property both and rest 23% are others.

Table 2.2:-How many vehicles in the above Property?

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**None**	22	22.0	22.0	22.0
	One	23	23.0	23.0	45.0
	Two	24	24.0	24.0	69.0
	Three	31	31.0	31.0	100.0
	Total	100	100.0	100.0	

The above table 2.2 indicates that the 31% majority of the respondents having three vehicles they owned. 24% of the majority of the respondents owned just two vehicles, 23% of the majority owned only one vehicle and 22% of the majority have no vehicle in the above property.

Table 2.3:-How many of these are parked on the street?

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**None**	59	59.0	59.0	59.0
	One	17	17.0	17.0	76.0
	Two	11	11.0	11.0	87.0
	Three	13	13.0	13.0	100.0
	Total	100	100.0	100.0	

The above table shows that the 59% of the respondents don't parked their vehicle on the street and rest 17%, 13% and 11 % of the respondents parked their vehicle on the street.

Table 2.4:-Do you have access to off-street parking facilities

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	32	32.0	32.0	32.0
	No	68	68.0	68.0	100.0
	Total	100	100.0	100.0	

The above table 2.4 shows that the 32% of the respondents they didn't have access to off- street parking facility but 68% majority of the respondents have access to the off-street parking facilities.

Table 3.1:-Are you happy with the current parking situation in your road?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	43	42.6	42.6	42.6
	No	57	56.4	56.4	99.0
	Total	101	100.0	100.0	

Section III. Parking Issue

The above table 3.1 shows that the 42.6% majority of the respondents are happy with the current parking situation on road and rest 56% of the respondents are not happy with the current parking situation.

Table 3.2:-Would you like parking issues in your road to be investigated further?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	73	72.3	72.3	72.3
	No	27	26.7	26.7	99.0
	Total	101	100.0	100.0	

The above table 3.2 indicates that the 72.3 % majority of the respondents are like to investigate future current parking issues. And 27% of the respondents are not likely feel that the parking issue should be investigated further.

Table 3.3:-Do you regularly find it difficult to find a space to park in your road?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	66	65.3	65.3	65.3
	No	34	33.7	33.7	99.0
	Total	101	100.0	100.0	

The above table 3.3 shows that the 65.4% of the majority of the respondents faces problem in finding a space to park their vehicle on road and 33.7% of the respondents easily find a space to park on road.

Table 3.4:-Do you ever have to park in your neighboring roads because there is no space in your own road?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	71	70.3	70.3	70.3
	No	29	28.7	28.7	99.0
	Total	101	100.0	100.0	

The above table 3.4 indicates that the 70.3% of the respondents park their vehicle on the neighboring road. While 28.7% of the majority of the respondents easily find a space to park on their own locality

Table 3.5:-a) Do you find vehicles are parked obstructing, unfairly and/or inconsiderately in your road?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	79	78.2	78.2	78.2
	No	21	20.8	20.8	99.0
	Total	101	100.0	100.0	

The above table 3.5 a) indicates that the 78% of the majority of the respondent's state that the vehicle are obstructing, unfairly parked on road, while 20% of the majority didn't agree with the above statement.

Table 3.5:-b) If yes, please give details.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Footway parking**	11	10.9	10.9	10.9
	Double Parking	13	12.9	12.9	23.8
	Vehicles left for long period of time	18	17.8	17.8	41.6
	Inconsiderate residents/visitors	24	23.8	23.8	65.3
	Taking up more space than necessary	10	9.9	9.9	75.2
	Obstruction to through traffic	15	14.9	14.9	90.1
	Other	9	8.9	8.9	99.0
	Total	101	100.0	100.0	

The above table 3.5 (b) state that the 23% of the majority of the respondent's state that the most of the vehicle are parked obstructively because of inconsiderate visitor. 17% of the respondent indicated that the vehicle is left for the longer period of time. 12% of the vehicles are unfair parked at double parking. 10% of the vehicles are parked at the footway parking and 9.9% of the respondents take more spaces than necessary to park their vehicle and 8.9% are the other reason obstructing, unfairly and inconsiderately on road.

Table 3.10:-(a) Do you find it difficult to turn at junctions in your road due to parked vehicles?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Yes**	74	73.3	73.3	73.3
	No	23	22.8	22.8	96.0
	Total	101	100.0	100.0	

The table 3.10(a) indicates that the 73% of the majority of the respondents are find difficulty and 23% of the majority of the respondents didn't find difficulty to park their vehicle at the junction.

Table 3.10:-(b) What are your reasons for parking on the roadside rather than the car parks?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Only paying a quick visit**	40	39.6	39.6	39.6
	Don't want to pay for an hour parking	22	21.8	21.8	61.4
	I have limited mobility and its closer to shops	25	24.8	24.8	86.1
	I struggle to pay parking charges	13	12.9	12.9	99.0
	Total	101	100.0	100.0	

The above table 3.10(b) states that the 37% of the majority of the respondents parked their vehicle on the roadside rather than the car park for quick visit. 24% majority of the respondents parked their vehicle on the road side as they think that they have limited mobility and its closer to the shop. 21% and 13% of the majority of the respondents parked their vehicle on roadside as they don't want to pay for an hour parking and they struggle to pay for parking charges respectively.

Table3.11:-How often do you park in the on-street spaces?

	Frequency	Percent	Valid	Cumulative Percent

				Percent	
Valid	**Once a day**	25	24.8	24.8	24.8
	2-3 times a week	26	25.7	25.7	50.5
	At weekends only	29	28.7	28.7	79.2
	More than once a day	20	19.8	19.8	99.0
	Total	101	100.0	100.0	

The above table 3.11 states that the 28% of the majority of the respondents parked their vehicle on the street spaces at weekends only. 26% of the majority of the respondents parked their vehicle on street spaces 2-3 times a week and 24% and 20% of the majority of the parked their vehicle on street once a day and more than once a day respectively.

Table no. 3.13:-When you parked in an on-street space, how long on average do you spend?

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Upto 10 min.	36	35.6	35.6	35.6
	10-20 min.	23	22.8	22.8	58.4
	20-30 min,	18	17.8	17.8	76.2
	30 min. to an hour	23	22.8	22.8	99.0
	Total	101	100.0	100.0	

The table 3.13 shows that the 35% of the majority of the respondents parked their vehicle on street an average period of 10 min. 22% of the majority parked their vehicle on street at an average period of 10-30min. and 17% of the majority of the respondents parked their vehicle on street at an average period of 30min to an hour.

Table no.3.14:-At what times of day is you most likely to park?

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Overnight**	24	23.8	23.8	23.8
	Between 6-9 am	11	10.9	10.9	34.7
	Between 9 am - 12 noon	15	14.9	14.9	49.5
	Between 1 pm to 4pm	22	21.8	21.8	71.3
	Between 4 pm to 6 pm	11	10.9	10.9	82.2
	Between 6 pm to 12 midnight	17	16.8	16.8	99.0
	Total	101	100.0	100.0	

The above table no.3.14 state that 24% of the majority of the respondents most likely to parked their vehicle overnight and 11% of the majority of the respondents which is least most likely to parked between 6am to 9 am.

Table no 3.15:-Which shops and businesses do you generally use when you park on the street?

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	**Food-Bakery/ Green Grocers/ Butchers/ Deli/ Health Food**	12	11.9	11.9	11.9
	Sports shop/ Heads/ Shoes Shop	35	34.7	34.7	46.5
	Books Shop/ Toy shop/ Art and Crafts/ Cart shops/ Knick-necks	15	14.9	14.9	61.4
	Art Gallery/Jeweler's/Shopping Malls	10	9.9	9.9	71.3
	Coffee shop/ Restaurant/Pups/Hotels	28	27.7	27.7	99.0

	Total	101	100.0	100.0	

The above table 3.15 states 27.7% that the majority of the respondents parked their vehicle on street which is very close to the coffee shops, restaurant, pups, and hotels. And 34.7% majority of the respondents parked their vehicle in from of the sports shops, heads, and shoe shops. While, 14% of the majority of the respondents parked their vehicle on-street which is very close access to the food-bakery, green grocers, butchers, dairy and health food. While 12% and 9% of the majority parked their vehicle on-street which is very close to the book shops, toy shops, art and crafts, art and gallery, jewelers shops and at shopping malls respectively.

Table no. 3.16:-In your opinion, how would you describe the number of parked vehicles in the sections of road around your property?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Very High**	32	31.7	31.7	31.7
	High	35	34.7	34.7	66.3
	Moderate	13	12.9	12.9	79.2
	Low	8	7.9	7.9	87.1
	Very Low	12	11.9	11.9	99.0
	Total	101	100.0	100.0	

The above table no. 3.16 indicates that the 34.7% and 31.7% majority of the respondents describes that the number of the parked vechile around their property is very high and high.and 12% and 8% of the majority sates that the number off vehicle parked around their property is low and very low.

Conclusion:-

Urban public transport in India is underdeveloped resulting in congestion on roads due to mixed traffic. The unreliable and rudimentary public transport system led to increased dependence in small, motorized vehicle among urban population. The more congestion traffics led to many major accidents. With the phenomenal increase in the personalized vehicle, one of the major problems confronted by the people is the acute shortage of the parking space. The demand for parking has increased in alarming rate across India. There are many disputes over parking spaces.

The proper parking system should be made to solve the non-parking issue. Increasing the parking spaces so that more vehicles can be parked. Improving accessibility and pedestrian paths around parking spaces to make it more convenient to walk from parking space to the destination.

This reduces the inconvenience of parking in a space that may not be very close to the desired location. Well managed parking and parking restraints have many benefits. Benefits to the vehicle users and it reduces traffic chaos. Environment benefits to the non-car users. Proper parking should be made to make the parking problems solved and also to reduce the number of crimes and its give benefit to the government and also general public.

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